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FORTY-SEVENTH ANNUAL REPORT

of the

BOARD OF TRUSTEES

of

The Clemson Agricultural College

to the

General Assembly of South Carolina

1936

The Clemson Agricultural College
RECORD

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TABLE OF CONTENTS

LETTER OF TRANSMITTAL

To the Members of the General Assembly
Columbia, South Carolina

Gentlemen:

The Trustees of The Clemson Agricultural College are pleased to transmit herewith, for your thoughtful consideration, the report of President E. W. Sikes, concerning the affairs of the College for the fiscal year July 1, 1935, to June 30, 1936.

The report is full and complete, and reviews in detail all College activities. It gives a fair conception of the broad and useful scope of work in which the institution is engaged, reflecting the very efficient service of the teaching staff and employees.

Respectfully submitted,

W. W. BRADLEY,
President, Board of Trustees.

July 1, 1936.

CLEMSON AGRICULTURAL COLLEGE

Clemson College (The Agricultural and Mechanical College of South Carolina) renders two major lines of service.

1 Collegiate Instruction

Courses leading to the B.S. degree in the following:
Agriculture
Architecture
Chemistry
General Science
Engineering
Textiles
Vocational Education
Summer School in Many Special Subjects

2 Public Service

Agricultural Research—Clemson College, Charleston, Florence, Pontiac and Summerville Experiment Stations.

Agricultural Extension—County agents serve in counties. Specialists serve any point in the State on request.
Cooperative experiments with farmers.

Fertilizer Inspection and Analysis—Inspects and analyzes the fertilizer bought and sold in the State.

Livestock Sanitary Work—Veterinarians are located in various parts of the State for control and eradication of infectious and contagious diseases.

State Crop Pest Service—Study and control of contagious plant diseases and insect pests.

Itinerant Teacher Training—In Vocational Agriculture and Industrial Education

Textile Research—At Clemson College, manufacturing tests—grades, staples, varieties—in cooperation with U. S. D. A.

Textile Testing—At Clemson College yarn testing service for cotton mills of South Carolina.

Report of the President of the College

Clemson, South Carolina
December 1, 1936

From E. W. Sikes
President, The Clemson Agricultural College

To The Honorable W. W. Bradley
President, The Board of Trustees

Dear Sir:

I have the honor to present to you the 47th report of the President of Clemson College, this report covering the 43rd session of the institution.

The work at Clemson College is distinctive. The institution was established to give to young men the opportunity for training in the agricultural and mechanical sciences. It has sought to adhere to its original purpose through continual adjustment to changing needs. The demand for agriculture in the public schools necessitated the development of a school for the training of agricultural teachers, and the same condition is growing in industry. The growing use of electric power required fuller courses in electrical engineering. Rural electrification will increase the efficiency of the farms and change living conditions, hence the scope of this school will have to be widened. The great stress that is now being given to agricultural and industrial economics will force the enlargement of these subjects.

The emphasis in education is shifting and is shifting in the direction of the A. and M. colleges. The rapid increase in enrollment at Clemson evidences that young men realize the changes that are taking place and they are willing to prepare themselves to meet the new situations. These young men have been in the public schools for eleven years, have acquired a general education, and now they feel that they must select some vocation and not spend four more years in preparing for

they know not what. Preparation may be so prolonged that it becomes a snare to action. Only about ten per cent it is said can learn any and all subjects. This group is the pride of teachers. This group makes up the intelligentsia—a most essential group. The others make up the group which will not contribute to society through advanced culture and philosophy, but they will contribute through doing the world's work. They will not become "white collar" workers but workers in overalls; with test tubes and transits they will man the great productive enterprises which create the material wealth to support us all.

In this industrial age technical and vocational training, being practical and active, is receiving, and in South Carolina should receive, more attention. This type of instruction is the peculiar field of Clemson and brings us in rivalry with no other college in the state. In fact advances in technical productive skill will help all other public institutions whether publicly or privately owned. Chemistry is fundamental to agriculture and textiles. All students must take chemistry, for which there can be no substitute, and I am asking the General Assembly to enlarge the facilities for chemistry at Clemson College. Our chemical laboratories, which were erected for 800, can not accommodate 1600.

AN IMPERATIVE NEED

Textiles and agriculture are the two largest industries in South Carolina both in the value of their annual products and the number of people employed. Clemson is now well equipped for agriculture and in cooperation with the United States Department of Agriculture is rendering valuable service to the farmers of South Carolina. It now behooves the state to do more for the textile industry. The present building is antiquated, dangerous, and unfitted to meet the present demands.

South Carolina has become a great textile center. Our young men are realizing that this field offers them an opportunity. Every year there is a call for more trained men than the college can supply. The industry realizes that trained men are needed to meet the competition that is coming from other countries. Japan is a dangerous competitor and today is shipping goods over the tariff walls into South Caro-

lina. The state can not afford even to try to meet this competition by reducing wages to the Japanese level, but it has to be met. The American way to meet it is to have improved efficiency, and this must come through research and textile education.

The United States Department of Agriculture is anxious to extend its researches in spinning and weaving and to study the qualities of cotton to be used in the mills. They wish to make these studies in the textile school, but we must furnish the building. The Department will furnish the men and the machinery. The cotton grower and the manufacturer are both helped by this coopertive arrangement, but the college's part is to furnish the building.

We do not want the industry in South Carolina to meet the fate which has befallen New England. We want to avoid smokeless stacks, empty buildings, and deserted villages. Supineness may be our ruin. We must see to it that opportunities do not slip from us. South America is bidding for our mills, our machinery, and our men. With our Anglo Saxon background, our inventive genius, and our trained men we must meet the danger.

We need to raise up, qualify, and send forth more men into the textile industry. It is entitled to more than we have done for it. We must supply the industry with a leadership which is intelligent and has initiative, men who can stabilize and strengthen it.

Agriculture and textiles are closely allied—the farmer grows the cotton, the manufacturer converts it into usable form. Both are a part of the same process. With the improved processes of climatic control and electric power distribution mills can be developed in every county of the state. With the eight-hour-a-day law, with shifts in labor force, with good roads and cheap transportation, a small subsistence farmer may own his own homestead and work in the mill at the same time.

RESEARCH DIVISION

The purpose of agricultural research is to find out new and profitable ways of improving farming. Conditions continually change; soils become depleted, destructive insects appear, and a multitude of other problems unheard of before

arise to worry and thwart the framer. Hundreds of letters come to the office yearly seeking advice and help. Many of these problems are so new that no scientist has heard of them before. He then must go to work in his laboratory and plots and chase the disease to its hidden lair. Research does for all farmers what would be too expensive and difficult for them to do individually.

The method of the research department is to establish experiment stations. There are six of these stations located in different parts of South Carolina. The newest station is located at Blackville in Barnwell County and is known as the Edisto Experiment Station. In cooperation with the United States Department of Agriculture scientists are employed at the stations, various projects are set up, tests are made, records are kept, conclusions are reached, and these are placed in the hands of the county agents and agricultural teachers both in the public schools and the college. These experiment stations work quietly and patiently exploding errors new and old, and discovering the truth so essential to success. The experiment stations are the miners and sappers of the agricultural army.

The policy of limiting production and acreage demands the substitution of other crops. This calls for new research The Federal Government is allotting additional funds to be used for new research only. To make these funds available the State will have to furnish more land and equipment. The South Carolina Experiment Stations must adjust these new findings to our local conditions. This adjustment must be brought about by state funds.

EXTENSION DIVISION

The purpose of the extension division is to carry to the farmers in their fields the latest and best discoveries and methods. The popularization of scientific knowledge is essential to agricultural progress. Concealed in technical bulletins or locked up in laboratories it would be useless. Such knowledge must needs be expressed in popular language and easily and sympathetically presented.

The method of the extension division is to have in each county a trained man as county agent and a trained woman as a home agent; also to have specialists in different sub-

jects to assist them. In every county also there are committees of farmers and farm women which cooperate and advise with the agents. The publications of the division are plain and simple in their style. Much printed matter is also carried in the local papers which matter is prepared by the county agents, the specialists, and the publications division. The whole work heads up under a director who resides at the college but who is the representative also of the United States Department of Agriculture which cooperates in all extension work. South Carolina was one of the first states to have agents in every county and to have them supported by state funds. No state surpasses South Carolina in the efficiency of its agricultural leadership and organization in the various counties. This includes boys and girls, men and women.

Some of the activities formerly under the Agricultural Administration Act have been transferred to the Extension Division of the Agricultural Colleges. The additional funds secured under this act will enable the college to employ Assistant Farm and Home Agents and Specialists which will mean a more intense dissemination of scietific agricultural information.

LIVESTOCK SANITARY DIVISION

The purpose of this department is to eradicate and protect against all contagious, infectious, and communicable diseases among livestock. There was no hope for the livestock industry as long as it was unprotected against epidemics.

The method of this division, in cooperation with the United States Department of Agriculture, is to locate veterinarians in strategic places in the state and to employ local veterinarians as their assistance is needed Its first major task was to eliminate the cattle tick from every county in the state and to protect against its reintroduction from infested areas. The second major task is to eradicate cattle tuberculosis from the herds. This task is now in progress. A well equipped laboratory is maintained in Columbia where the staff receives specimens from farmers and others, diagnoses the disease, and prescribes the treatment. Members of the staff will visit any place where cholera or any other contagious disease is suspected and cooperate in preventing the spread.

Having about completed its two major tasks the Federal Government will now undertake a third—the elimination of Bang's disease among cattle.

CROP PEST COMMISSION

The purpose of this department is to fight the pests that prey on various crops and to inspect nurseries, greenhouses, bulb farms, and apiaries. Its purpose also is to protect the state against importation of diseased nursery stocks, infected cotton seed, and other such things, and also to issue certificates to growers in this state so that they may market their plants and seeds in other states. This much of the work is regulatory. This commission passes regulations bearing upon shipments. It also cooperates with the federal government in fighting such pests as the pink boll worm, the Japanese beetle, and the European corn borer.

In order to accomplish this the agricultural committee of the board of trustees is made the State Crop Pest Commission; the professor of entomology is the state entomologist; and the professor of plant pathology is the state pathologist. Since their time is also taken up in teaching it is necessary to employ an assistant who does much of the inspection in different parts of the state.

FERTILIZER INSPECTION AND ANALYSIS

The purpose of this department is to analyze the fertilizers that are sold in South Carolina and to see that they contain the proper proportion of ingredients specified and guaranteed. South Carolina uses a large amount of fertilizers. The analysis protects the farmer and the manufacturer—the farmer against fraud and the manufacturer against unfair competition. Chemists are employed under the Director of Research to analyze samples which come to them without name but with only a number.

The samples are received by the Secretary of the Board of Fertilizer Control which board consists of four members of the board of trustees. The Secretary numbers each sample and sends it to the chemists in the fertilizer laboratory.

There are three ways by which samples may be drawn:

1. By an inspector appointed by the Board of Fertilizer Control.

2. By a representative of the manufacturer and a representative of the buyer, and a third person selected by the two.
3. By county agents who are trained and authorized to draw samples.

PRESENT SESSION

The session for 1936-1937 began on September 14. To date the total enrollment is 1597 and of this number 596 are new students. This year 61 students entered Clemson from other colleges. They came to Clemson to secure the technical training they wished. Since these men entered the upper classes they could be well accommodated.

The Agricultural Adjustment Act has made demands on the college for the use of its staff. Numbers of the Public Service men have been loaned to the Federal Government for varying lengths of time. The Extension and Research forces have cooperated in the programs. This work is in line with the work of the Agricultural and Mechanical Colleges and such colleges are expected by the Federal Government to contribute to and strengthen its personnel. The analysis of soils conducted here for the farms in South Carolina has been most beneficial to the farmers. More and more the United States Department of Agriculture will wish this work to be done in cooperation with the State Agricultural and Mechanical Colleges. If we can furnish the facilities the Federal Government will furnish the men.

Respectfully submitted,

E. W. SIKES, President

ENROLLMENT BY COUNTIES AND STATES FOR 1936-37

County	Total
Abbeville	24
Aiken	33
Allendale	19
Anderson	120
Bamberg	15
Barnwell	14
Beaufort	12
Berkeley	5
Calhoun	16
Charleston	88
Cherokee	17
Chester	28
Chesterfield	20
Clarendon	12
Colleton	28
Darlington	32
Dillon	18
Dorchester	7
Edgefield	23
Fairfield	13
Florence	47
Georgetown	10
Greenville	106
Greenwood	45
Hampton	23
Horry	18
Jasper	7
Kershaw	16
Lancaster	12
Laurens	40
Lee	24
Lexington	22
Marion	32
Marlboro	19
McCormick	6
Newberry	31
Oconee	60
Orangeburg	54
Pickens	74
Richland	53
Saluda	23
Spartanburg	89
Sumter	24
Union	31
Williamsburg	11
York	37
Total—South Carolina	1458

County	Total
Alabama	4
Connecticut	2
Delaware	1
Florida	9
Georgia	40
Illinois	1
Kentucky	1
Maine	1
Massachusetts	1
New Jersey	10
New York	6
North Carolina	43
Ohio	1
Pennsylvania	7
Rhode Island	1
Tennessee	4
Texas	1
Virginia	4
West Virginia	2
Grand Total	1597

OCCUPATIONS OF PARENTS

Agriculture	527
Clerical Occupations	37
Manufacturing and Mechanical Industries	133
Professional Service	193
Public Service	121
Trade	358
Transportation and Communication	86
Other Occupations	42
Not Given	92
Retired	8
Total	1597

REPORT OF TREASURER

Dr. E. W. Sikes, President
The Clemson Agricultural College
Clemson, South Carolina

Dear Dr. Sikes:

I have the honor of transmitting herewith my annual report of the financial affairs of the Clemson Agricultural College of South Carolina for the fiscal year July 1, 1935 to June 30, 1936 in accordance with an act of the General Assembly.

Respectfully submitted,

S. W. EVANS,
Secretary-Treasurer.

THE CLEMSON AGRICULTURAL COLLEGE

Collegiate Activities

FISCAL YEAR

JULY 1, 1935 to JUNE 30, 1936

INCOME

1—State Appropriation		$ 90 000 00
2—Privilege Fertilizer Tax	$154 000 00	
Less Cost Inspection and Analysis	19 697 29	134 302 71
3—Federal Funds:		
Morrill-Nelson and Bankhead-Jones Funds	35 000 00	
Landscrip	5 754 00	40 754 00
4—Tuition and Fees		127 088 63
5—Interest Clemson Bequest		3 512 36
6—Miscellaneous Funds:		
Rents College Residences, Sales Electric Lights and Water		30 231 38
TOTAL INCOME COLLEGIATE ACTIVITIES		$425,889.08

Collegiate Activities

EXPENDITURES JULY 1, 1935—JUNE 30, 1936
Exhibit A

A—Personal Service:			
1. Salaries:			
Morrill-Nelson and Bankhead-Jones Funds	$35 000 00		
Landscrip	5 754 00	$ 40 754 00	
Other Funds		212 767 82	
		$253 521 82	
2. Wages		39 529 73	
3. Special Payments		1 098 72	$294 150 27

B—Contractual Service:			
1.	Freight, Express and Deliveries	$ 175 44	
2.	Travel	2 692 00	
3.	Telegraph and Telephone	2 014 22	
4.	Repairs	23 182 01	
5.	Printing Catalogs, Bulletins, Etc.	2 677 55	30 741 22
C—Supplies:			
2.	Fuel and Electric Current	$ 22 282 01	
3.	Feed and Veterinary Supplies	2 462 88	
4.	Office Supplies	6 384 90	
7.	Educational Supplies	8 348 22	
8.	Motor Vehicle Supplies	2 214 22	
9.	Agricultural Supplies	910 52	
11.	Other Supplies	3 193 87	45 796 62
D—Fixed Charges and Contributions:			
1.	Rent	$ 19 00	
2.	Insurance	19 217 75	
4.	Other Fixed Charges	3 143 66	22 380 41
G—Equipment:			
1.	Office Equipment	$ 832 53	
4.	Motor Vehicle Equipment	400 00	
6.	Livestock	150 00	
7.	Educational Equipment	1 664 04	
8.	Other Equipment	33 64	3 080 21
H—Lands and Structures:			
2.	Buildings	$ 9 219 63	
	Transfer to Building Sinking Fund:		
	Agricultural Building Bonds $12 800 00		
	Additions to Water Plant and gymnasium 7 200 00	20 000 00	29 219 63
	TOTAL COLLEGIATE ACTIVITIES		$425,368.36

Fertilizer Inspection and Analysis, Poison Analyses, Analyses of Water, Soils, Manures, Etc.

A-1	Salaries	$ 9 828 00	
A-2	Wages	3 318 50	
A-3	Legal Services	250 00	
B-1	Freight and Express	94 89	
B-2	Travel	1 986 78	
B-3	Telegraph and Telephone	106 02	
B-4	Repairs	82 26	
B-5	Fertilizer Bulletins	275 43	
C-4	Office Supplies	274 27	
C-11	Other Supplies (tags, etc.)	3 476 64	
D 1	Post Office Box Rent	4 50	$ 19 697 29

Smith-Lever Agricultural Extension Work

Exhibit B

Receipts:			
Appropriations:			
Federal		$434 643 89	
State		136 000 00	$570 643 89
Expenditures:			
A-1	Salaries	$416 317 67	
A-2	Wages	821 51	
B-1	Freight and Express	502 15	
B-2	Travel	70 828 86	
B-3	Communication Service	9 134 78	
B-5	Publications	5 532 44	
B-6	Heat, Light and Water	683 57	
C-11	Supplies and Materials	15 632 61	
D-1	Office Rent for Agents	2 767 23	
G-1	Furniture, Fixtures and Equipment	47 083 07	$569 303 89

South Carolina Experiment Station Federal Funds

(Hatch, Adams, Purnell, Bankhead-Jones Funds)

Exhibit C

Receipts:			
Receipts from Treasurer of the United States:			
Hatch Fund		$ 15 000 00	
Adams Fund		15 000 00	
Purnell Fund		60 000 00	
Bankhead-Jones Fund		14 866 24	$104 866 24
Expenditures:			
A-1	Salaries	$ 57 478 10	
A-2	Wages	16 765 15	
B-1	Freight and Express	446 81	
B-2	Travel	3 227 85	
B-3	Telegraph and Telephone	1 004 94	
B-5	Publications	1 101 04	
B-6	Heat, Light and Water	555 84	
C-3	Feed and Veterinary Supplies	2 776 23	
C-4	Office Supplies	783 33	
C-7	Educational Supplies	733 56	
C-9	Fertilizer	563 37	
C-11	Other Supplies	3 257 20	
E-1	Contingences	9 31	
G-1	Office Equipment	1 901 07	
G-4	Motor Vehicle Equipment	1 952 79	
G-5	Agricultural Equipment	3 975 24	
G-8	Other Equipment	3 588 73	
H-2	Buildings	339 73	
H-3	Non-Structural Improvements	4 405 95	$104 866 24

Agricultural Research

Paid by Warrants on Comptroller General of South Carolina

Exhibit D

Expenditures:

A-1	Salaries	$ 23 526 05	
A-2	Wages	5 523 64	
A-3	Special Services	25 00	
B-2	Travel	1 716 11	
B-3	Telegraph and Telephone	145 18	
B-4	Repairs	546 02	
B-5	Printing	484 04	
B-6	Water, Heat, Light and Power	481 91	
C-3	Feed and Veterinary Supplies	647 90	
C-4	Office Supplies	503 28	
C-8	Motor Vehicle Supplies	1 032 59	
C-9	Agricultural Supplies	3 209 89	
C-11	Other Supplies	205 42	
D-1	Rents	675 23	
D-2	Insurance	89 66	
G-4	Motor Vehicle Equipment	992 93	
G-7	Educational Equipment	32 85	
G-8	Other Equipment	162 30	$ 40 000 00

Crop Pests and Diseases

Paid by Warrants on Comptroller General of South Carolina

Exhibit E

Expenditures:

A-1	Salaries	$ 6 582 00	
B-2	Travel	392 47	
B-4	Repairs	96 35	
C-4	Office Supplies	52 76	
C-8	Gasoline and Oil	311 12	
C-9	Agricultural Supplies	11 82	
D-4	Other Fixed Charges	7 75	
G-1	Office Equipment	45 63	$ 7 499 90

Livestock Sanitary Work

Paid by Warrants on Comptroller General of South Carolina

Exhibit F

Expenditures:

A-1	Salaries	$ 22 265 90	
A-3	Special Payments	3 300 75	
B-2	Travel	7 692 14	
B-3	Telegraph and Telephone	345 58	
C-4	Office Supplies	319 58	
C-11	Other Supplies	172 99	
D-2	Insurance	24 59	
D-3	Contributions	22 66	
G-1	Office Equipment	95 26	
G-8	Other Equipment	209 32	$ 34 448 77

Truck Experiment Station

Paid by Warrants on Comptroller General of South Carolina

Exhibit G

Expenditures:			
A-1	Salaries	$ 1 941 98	
A-2	Wages	2 648 47	
B-2	Travel	67 32	
B-3	Telegraph and Telephone	88 54	
B-4	Repairs	227 79	
B-6	Light, Water and Power	296 92	
C-4	Office Supplies	68 28	
C-8	Motor Vehicle Supplies	453 57	
C-9	Agricultural Supplies	1 030 21	
C-11	Other Supplies	194 73	
G-8	Other Equipment	220 54	
H-3	Non-Structural Improvements	611 65	$ 7 850 00

Eradication of Japanese Beetle

Paid by Warrants on Comptroller General of South Carolina

Exhibit H

Expenditures:			
C-11	Supplies	$ 1 442 88	$ 1 442 88

Cadet Fund

(These funds, paid by the students for their living and other expenses, are kept entirely separate. None of this money is used to pay the cost of teaching.)

Exhibit I

Expenditures for Board, Laundry, Room, Uniforms, Hospital, Student Activities and Incidentals:		
A-1	Salaries	$ 19 566 05
A-2	Wages	58 014 63
A-3	Special Services	1 071 00
B-1	Freight and Express	102 17
B-2	Travel	439 80
B-3	Telegraph and Telephone	555 20
B-4	Repairs	9 478 75
B-5	Printing	11 407 09
C-1	Food Supplies	136 288 84
C-2	Fuel Supplies	15 705 89
C-4	Office Supplies	400 51
C-5	Laundry Supplies	3 737 94
C-6	Medical Supplies	2 728 47
C-7	Educational Supplies	916 16
C-8	Motor Vehicle Supplies	1 362 51

C-10	Uniforms	36 036 13	
C-11	Other Supplies	16 197 24	
D-2	Insurance	729 08	
D-4	Payment on Debt (Field House)	3 400 00	
D-4	Interest (Field House)	85 00	
D-4	Other Fixed Charges	1 134 79	
G-1	Office Equipment	331 86	
G-2	Medical Equipment	3 617 07	
G-3	Household Equipment	903 44	
G-7	Educational Equipment	92 80	
G-8	Other Equipment	12 253 82	$336 556 24
	Total Expenditures		$336 556 24
	Refunds to Students		9 720 26
	Total		$346 346 50
Balance on Hand July 1, 1935		$ 11 967 43	
Balance on Hand June 30, 1936		23 405 02	

Student Banking Account

Exhibit J

Balance on Hand July 1, 1935	$ 5 479 70	
Deposits Current Year	126 633 13	$132 112 83
Checks—Paid Current Year	$127 276 77	
Balance June 30, 1936	4 836 06	$132 112 83

REPORT OF DIRECTOR OF EXTENSION

Dr. E. W. Sikes, President
The Clemson Agricultural College
Clemson, South Carolina

Dear Sir:

I hand you herewith the annual report of the Extension Service for the calendar year 1935. This report is suitable for the annual report of the Board of Trustees to the General Assembly of South Carolina covering this branch of work.

Respectfully submitted,

D. W. WATKINS, Director

EXTENSION WORK IN SOUTH CAROLINA, 1935

The Extension Service of South Carolina marks the year 1935 as one in which more progress has been made along basic extension educational lines than had been possible in any year since 1932. It is safe to say that along these lines it has been the most fruitful year's work, from the standpoint of accomplishments, since the beginning of the depression.

Experience gained in 1933 and 1934, together with the help of more experienced clerical assistants, local leaders, and committeemen, enabled county agents, home demonstration agents, specialists, and supervisors to carry on a well rounded program of educational demonstration work with less interference than heretofore from the heavy burden of the Agricultural Adjustment Administration programs and other emergency work placed on their shoulders.

ORGANIZATION

Headquarters

The headquarters of the South Carolina Extension Service is located at The Clemson Agricultural College, at Clemson, which is the land-grant college for the state. The home demonstration service maintains headquarters at Winthrop College, Rock Hill, the state college for women. Negro extension work is administered from the state Negro college at Orangeburg.

Personnel

The director of extension at Clemson is in charge of all extension work in the state. He is assisted in supervision of county agent work by an assistant, three district agents, 22 specialists, and one chief clerk and accountant. County workers include 46 county agents, one in each county, 15 assistant county agents, and 14 assistants in soil conservation, who are employed on a cooperative basis with the Soil Conservation Service.

Personnel of the home demonstration service includes a state leader of home demonstration work, an assistant state leader, three district

agents, seven specialists, 46 home demonstration agents, one in each county, and four assistant home demonstration agents.

The Negro extension service is made up of one district agent, one state leader of Negro home demonstration work, 15 Negro county agents, and 13 Negro home demonstration agents.

THE 1935 PROGRAM OF EXTENSION WORK

The 1935 program of extension work in South Carolina was designed to teach through practical demonstrations a system of economic and balanced production of a high quality of crops and livestock; the standardization and orderly marketing of farm products; the conservation and improvement of our soils, forests, and other natural resources; the proper feeding and clothing of our greatest asset, the farm family; the improvement and beautification of farm homes; and the broadening of cultural and recreational facilities for farm people; all to the end that permanence and security might be established for the farm people upon which they may build a safe and progressive agriculture for the state.

AGRICULTURAL ADJUSTMENT WORK IN 1935

Four commodity adjustment programs, cotton, tobacco, corn-hog, and peanuts, were conducted under the supervision of the Extension Service in 1935.

For the third consecutive year these programs included a volume of work that taxed to the limit the facilities of the Extension Service, and the job was accomplished only through the almost unanimous backing of the farmers of the state, and conscientious, efficient, and untiring work of the county and community committeemen.

The farmers of the state are united in their knowledge that the AAA programs have saved them from bankruptcy and ruin. In addition, thousands of farmers have taken advantage of the reduction in cotton and tobacco acreage to balance their farming programs with soil-building crops and sufficient food and feed crops for home use.

A total of 98,023 cotton acreage reduction contracts, 109,570 applications for tax-exemption certificates under the Bankhead law, 16,246 tobacco reduction contracts, over 25,000 applications for tax-exemption certificates under the Smith-Kerr law, 1,799 corn-hog contracts, and 463 peanut contracts were handled through the county agents' offices and the state offices in connection with these programs during 1935. In addition compliance was established through measurements by committeemen on all commodity contracts, and all applications for cotton price adjustment payments were handled for the farmers of the state.

Rental and benefit payments to the farmers of the state from these programs amounted to $10,105,227.19 in 1935.

An example of the concrete value of the AAA programs is shown by the fact that in 1932 South Carolina's cotton crop, both lint and seed, brought the farmers $29,760,000, while in 1935 the value of the cotton crop, including rental and benefit payments of $9,612,848, amounted to $61,779,848, an increase of 105 per cent over the value of the 1932 crop.

WORK IN AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

Farmers Keep Records and Accounts

While there are many exceptions, farmers as a rule are not inclined to keep accurate records on the business operation of their farms. The AAA programs have shown many farmers the importance of having accurate records, and county agents report 4,492 demonstrations in farm record keeping in 1935.

In addition to the complete farm records, 91 enterprise records covering all phases of production were kept on tobacco and 65 on Irish potatoes. These records were summarized and analyzed by the farm management specialist, the strong points and the weak points in production and marketing pointed out to the growers, and the material gained has been added to the teaching material of the Extension Service in these lines.

Outlook Work Popular with Farmers

The farmers of the state have come to depend to a great extent upon the outlook information assembled by the Extension Service and presented to them from year to year. In 1935 the farm management specialist published 18 newspaper articles on outlook information, which were followed by 176 such articles by county agents. Outlook meetings totaling 563 were held with farmers during the year.

Farm Financing Important

Seventy-two educational meetings were held by county agents on farm financing, and 12,015 farmers were assisted in making applications for crop loans. All told, 799 farmers were assisted in making adjustments of mortgages and debts, and 2,089 farmers were assisted in making leases and rental agreements.

EXTENSION WORK WITH FIELD CROPS

Five-Acre Cotton Improvement Contest

The Extension Service conducted in 1935 for the tenth consecutive year the South Carolina Five-Acre Cotton Improvement Contest. With the exception of two years, 1932 and 1933, of this 10-year period, an annual sum of $2,000.00 was made available as prize money, one year by The State Publishing Company and seven years by the South Carolina Cotton Manufacturers' Association. This prize money was awarded each year to those farmers who produced the highest yields of lint cotton per acre of a length of staple found to be the most profitable on South Carolina farms.

The purpose of the contest has been to improve the yield and the length and quality of staple produced by South Carolina farmers. Through the five-acre contest 430 demonstrations of improved methods of cotton production were completed in 1935, representing every county in the state, and during the eight years in which prizes have been offered 3,182 demonstrations have been completed.

The improved practices taught by these demonstrations, which included all phases of cotton production, and the improvement in staple length of South Carolina cotton, which resulted mainly from the spread from these demonstrations of purebred seed of improved varieties, have added millions of dollars during these years to the value of the cotton crop of the state.

Yield and Value of Lint per Acre for Various Staple Lengths

During six years of the cotton contest records were kept on the value of lint per acre for the various staple lengths of cotton grown. An analysis of these records shows that the staple lengths from 1 inch to 1 1/8 inches gave the highest yields and highest value per acre, with cotton of 1 1/32 inch staple leading all other lengths. Following is given a summary of these results.

Average Yield by Staple Lengths for 1928-29-30-31-34-35 and Value per Acre at 1935 Prices*

Staple	7/8	15/16	1	1 1/32	1 1/16	1 1/8
Number of acres	1285	2890	4515	2930	2435	615
Average pounds lint per acre	486	511	536	590	533	517
Value per pound, cents**	11.92	12.30	12.66	12.87	12.97	13.37
Value per acre, dollars	57.93	62.85	67.86	75.93	69.13	69.12
Increased acre value over 7/8 inch, dollars	----	4.92	9.93	18.00	11.20	11.19

*No records kept on these contests in 1932 and 1933.

**Prices approximate. Basis 7/8 middling, 10 spot markets. Differential from Cotton Market News service, U. S. Department of Agriculture, December 5, 1935.

Cotton from 2,933 farmers is represented in this table. No figures on average yield and price by staple lengths were kept in 1926, 1927, 1932, and 1933.

Effect of Row Width on Yield

Results for the eight years in which records were kept on the effect of row width on yield per acre are shown in the following table.

Effect of Row Width on Yield per Acre

Row width inches	1935 Number 5-A fields	1935 Lbs. lint per acre	Eight-year average Number 5-A fields	Eight-year average Lbs. lint per acre
30-34	79	585	248	612
35-37	92	555	731	552
38-40	88	565	747	549
41-43	106	556	737	536
44-46	46	535	360	514
47-49	13	542	288	504
50-60	6	458	71	477
Total 5-A Fields	430		3,182	

This table shows that during this eight-year period on 3,182 farms in every county of the state, on all soil types, and under different weather conditions, the yield of lint per acre increased consistently as the row width was narrowed. This held true down to 30-inch rows, below which it is impossible to cultivate the crop properly.

The results of the contest have been reflected in a gradual narrowing of the cotton rows on farms throughout the state.

Improvement in Length of Staple

During the eight years of the contest 95 per cent of the five-acre plots entered have been planted with pedigreed seed. Each contestant has become a source of improved planting seed in his community. This, with the publicity given the results of the contest by the press of the state, the banks, the cotton mills, the county agents, extension specialists, and others interested in cotton improvement has impressed upon farmers in increasing numbers the wisdom of using improved planting seed.

In 1926, the first year of the contest, 55 per cent of the lint produced by farmers in the contest was of 7/8 inch length or less, while in 1935, only 1 per cent of the cotton produced on 430 five-acre fields entered in the contest was of 7/8 inch length or less.

In 1926, the year the cotton contest was started, less than 20 per cent of South Carolina's cotton crop was of 15/16 inch or longer staple. Since that time the quality of the lint has been improved by the use of better seed to a point where 81.4 per cent of the 1935 crop was of 15/16 inch or longer staple.

Reports by the Bureau of Agricultural Economics of the United States Department of Agriculture, in cooperation with experiment stations in the cotton belt, show that South Carolina is leading the southeastern states in the production of lint of 15/16 inch or longer. Following is a table showing progress made since 1929.

Percentage of Crop 15/16 Inch Long or Longer*

State	1929	1930	1931	1932	1933	1934	1935
South Carolina	36.7	53.3	60.6	76.0	64.6	79.8	81.4
North Carolina	24.4	40.7	57.8	69.1	56.7	73.4	69.7
Georgia	10.8	15.8	22.9	25.3	27.5	42.0	48.6
Alabama	2.8	5.4	15.5	14.1	18.5	17.9	13.5
United States						55.0	58.9

*U. S. Department of Agriculture, Bureau of Agricultural Economics, and cooperating state experiment stations, Grade and Staple Reports, December 1, 1935.

Work with Tobacco

Foremost among the results of tobacco work for 1935 are the data obtained from records of 91 farmers who kept complete enterprise records

covering all phases of tobacco production. These records were brought together and analyzed in an effort to bring to light and study practices contributing to the success or failure of tobacco growers. Valuable lessons on soil types, fertilizers and manures, preparation of soil and cultivation, seed bed preparation, spacing of plants, curing, labor distribution, rotation of crops, and costs of production were obtained from these records. The conclusions drawn have been presented to tobacco growers in all tobacco counties for their information and guidance, and will be added to and strengthened by results obtained from year to year in this work.

As a result of cooperation from fertilizer manufacturers several hundred tons of special tobacco fertilizer were placed with growers throughout the tobacco belt. This gave a majority of growers an opportunity to see the actual results in the field.

The value of the 1935 tobacco crop in South Carolina was over $16,000,000.

Other Demonstrations with Field Crops

The record shows that other crops demonstrations conducted by farmers cooperating with the Extension Service include: corn production, 282; farmers assisted with corn fertilizer problems, 9,192; wheat production, 90; production of oats, 122; barley, rye, and other cereals, 56; lespedeza, 167; pastures, 164; soybeans, 55; cowpeas, 113; peanuts, 38; other legumes and forage crops, 149.

EXTENSION WORK WITH LIVESTOCK

An increasing number of farmers of the state are realizing the importance of livestock in balancing their farming programs and increasing their farm income. A growing interest in beef cattle and swine production, together with improved marketing facilities and better prices, has made it possible for the Extension Service to focus the farmer's attention on the advantages of better breeding and type in the animals he produces for the market, and consequently in those produced for home use.

Quality Beef Cattle Breeding Stock Placed

The beef cattle producers of the state have learned that the most practical and economical way to improve the quality of their herds is through the use of purebred bulls of merit on their grade cows. Interest in this method of improvement is shown by the fact that the Extension Service assisted in the placing of 109 selected purebred Hereford and Angus bulls on farms of the state during 1935. In addition, farmers were assisted in the selection and purchase of 35 purebred heifers of these breeds to be used as foundation stock for breeding herds.

4-H Club Boys Conduct Beef Calf Demonstrations

Feeding beef calves for show and sale as a major project for 4-H club boys had its beginning in South Carolina in 1935, when 59 calves

were grown out by 4-H club boys. Eleven of these calves were exhibited and sold at the Savannah livestock show and sale at Savannah, Georgia, and 48 were exhibited and sold at the South Carolina State Fair. Accurate records were kept on the costs and returns on this project by the boys themselves, and a large majority of them made a nice profit on the enterprise.

Feeding Hogs for Profit

South Carolina demonstration-fed hogs have become known on the markets in the eastern states, and the farmers of the state have learned from the demonstration method of feeding, taught by the Extension Service, and through accurate records kept on these demonstrations, that there is a profitable place in the farming program for good hogs grown out and finished on home-grown feeds and a protein supplement.

The demonstration records on 16 farms including 1044 hogs in 1935 show an average daily gain of 1.55 pounds per pig, with an average net return of $1.45 per bushel for all corn fed. In other words, these farmers sold corn through their hogs for 50 to 75 cents more per bushel than they would have received from a direct sale of this corn.

Farmers Buy Purebred Hogs

County agents and livestock specialists assisted farmers in selecting and buying 56 purebred boars in 1935.

Meat Curing and Canning

Thousands of pounds of meat are lost on South Carolina farms every year on account of unfavorable weather at curing time. In addition, much of the meat saved is of inferior quality because of poor curing methods. The Extension Service assisted in the establishment of three meat-curing plants in 1935, bringing the total so established to 30 in operation in the state. Farmers are coming more and more to rely on these plants for the safe curing of their year's meat supply.

Sixteen meat cutting, curing, and canning demonstrations were held at curing plants and on farms in nine counties of the state during 1935. These demonstrations during the past few years have done much to improve the quality of meat saved on the farms of the state for home consumption and sale.

Better Methods of Marketing Livestock

For years the greatest problem in connection with the livestock industry of the state has been the lack of adequate marketing facilities. During these years high grade and quality beef cattle and hogs have been shipped to the eastern and northern markets and successfully sold. However, a large proportion of the animals produced in the state cannot compete on these markets with the quality of that shipped by the western farmers. Then, when the low prices of the depression, with no corresponding decrease in freight rates, heavily reduced the shipments of even high grade cattle out of the state, the surplus which accumulated on the

farms practically stagnated the industry. The situation was made worse by the fact that central auction markets had been established in adjoining states, and our buyers were going to these central markets for their needs.

To help meet this situation, the Extension Service in 1934 cooperated with other organizations and individuals in the establishment of the Columbia livestock auction market. This method of sale proved immediately popular, and during 1935 livestock to the value of over $500,000.00 was sold through this market. Farmers have also taken advantage of similar markets in other states, with the result that beef cattle and hogs, especially of the lower grades, have moved into trade channels during the past year with far less difficulty than usual.

Practically all demonstration-fed hogs of good quality are marketed through cooperative truck and carlot shipments, organized by the county agents. During 1935 a total of 532 farmers sold 11,352 hogs in these shipments for a total of $172,731.10.

EXTENSION WORK IN DAIRYING

The dairymen of the state continue to make substantial progress in overcoming their two greatest problems, the production of sufficient home-grown feed and the improvement of the dairy stock on their farms. The county agents and extension dairy specialist pushed their work along these lines in 1935, and the record shows that demonstrations in permanent and temporary pastures and in hay and grain crops were conducted in every county of the state, and that 101 selected purebred bulls were placed with farmers for use on their herds and in their communities.

Keeping Figures on the Bulls

Unless records are kept it is hard to estimate the value of a purebred bull in a community. Ten dairy farmers in Newberry county kept breeding records on 14 bulls in 1935, these records showing that 107 other farmers in these communities bred 379 cows to these 14 bulls, and that from these breedings, 255 calves were dropped, 141 of which were heifers.

4-H Calf Club Work

A major project in 4-H calf club work was conducted in 10 counties with 78 boys and girls enrolled. These club members made a total of $6,060.00 profit on their work, or an average profit of $77.70 per member. Fifty-two of these calves were shown at the South Carolina State Fair, competing in the 4-H club classes, and with distinction in the open classes.

The Trench Silo a Boon to Dairymen

The trench silo is solving the winter succulent feed problem on many farms of the state. Inexpensive and easy to build, and at the same time wholly effective in the preservation of silage, this type of silo has enabled many farmers to provide their herds with silage when otherwise they

would not have been able to do so. Nineteen trench silos with a total capacity of 653 tons were added in 1935 to several hundred already in use in the state.

Marketing Dairy Cattle and Dairy Products

The dairy specialist and the county agents assisted in marketing 176 cows and heifers for the farmers of the state for a total of $22,073.00.

Assistance was given dairymen and farmers in marketing dairy products through cooperative associations around the larger population centers and through creameries, cream routes, and cream stations in the rural sections. The value of products so marketed amounted to $90,117.77 in 1935.

The Dairy Division cooperated with the South Carolina Guernsey Cattle Club in its annual consignment sale. Forty-two animals were sold for $9,060.00, or an average of $215.71 each. In like manner cooperation was given the South Carolina Jersey Cattle Club's consignment sale at which 25 animals were sold for $2,214.00, or an average of $88.56 each.

Other Work in Dairying

Several herd management demonstrations were conducted to bring to light facts and figures on dairy farm operation for study and analysis. Three dairy tours and field days were held, 206 result demonstrations in dairying were conducted, two bull associations were formed, and 3,824 farm women were assisted in butter-making and cheese-making.

WORK WITH INSECTS AND PLANT DISEASES

It is conservatively estimated that insects and plant diseases cost the farmers of the state around $35,000,000 each year through damage to crops and livestock. This is a staggering figure when compared with the total value of the farm products of the state.

While much of the work of the Extension Service along this line consists of emergency assistance to farmers in fighting some sudden outbreak of insect or crop disease damage, a certain amount of annual or seasonal damage occurs with such regularity that its advent can be forecast, and it is in warning farmers in advance of these outbreaks and advising them as to effective means of prevention and control that much valuable service is rendered.

Fighting the Screw Worm

The appearance of the true screw worm was first reported in the state in 1934. During that year injury to livestock was reported in one-third of the counties of the state. During 1935 outbreaks of a serious nature were reported in 44 of the 46 counties of the state.

Quick action was necessary to prevent serious livestock losses, and county agents, working with the extension entomologist and a representative of the Bureau of Entomology and Plant Quarantine, gave hundreds of demonstrations of prevention and control practices to the farmers of

the state and in addition assisted thousands of farmers in saving affected animals. As a result of this work, livestock losses in the state were held to a minimum.

Other Livestock Insects

Assistance was given by the Extension Service to 6,618 farmers in the prevention and control of poultry parasites, 4,054 farmers were assisted with the problem of parasites of dairy cattle, and 1,075 in the same manner with beef cattle. Help was given 5,029 farmers with the prevention and control of worms in hogs, and 89 were given aid with sheep parasites. In many cases farmers were advised to contact the State Livestock Sanitary office for aid in connection with outbreaks of livestock insects and diseases.

Annoying and Costly Household Insects

The county agents and the extension entomologist receive hundreds of requests each year for methods of control of cockroaches, bed bugs, and termites. The first two pests mentioned cause untold annoyance and discomfort, while the annual damage by termites to the homes and other buildings of the state is estimated at around $3,000,000. Much educational work has been done and hundreds of people have been assisted in the prevention and control of these pests.

Keeping Up the Fight on the Boll Weevil

Damage from the boll weevil varies from year to year, depending upon a number of weather factors. However, losses from weevil damage continue to amount to several millions of dollars each year in the cotton crop of the state.

The campaign for the use of early sweetened poison as a means of control was pushed on all fronts in 1935 and, particularly in the Piedmont section of the state, more sweetened poison was used than ever before.

Infestation counts made during June and July of 1935 in all counties of the state showed an average of six per cent infestation in fields where early molasses poison had been used as recommended, as compared with 14 per cent average infestation in fields where no poison has been used.

Other Crop Insect and Disease Work

The record shows that 20,135 farmers were assisted with crop insect problems, and 10,391 were given help in preventing and controlling crop disease damage. Practically all classes of farm, garden, orchard, and truck crops, as well as valuable ornamental plants, are listed in the record of work.

EXTENSION WORK WITH BEEKEEPERS

Extension work in beekeeping was conducted with beekeepers through county beekeepers' associations in 20 counties, and with individual beekeepers in all counties of the state. Eighty-two farmers were assisted in

transferring bees from 420 box hives to modern loose-frame hives, 106 farmers were assisted with disease problems, and 91 requeening demonstrations were given, through which 336 hives were requeened.

EXTENSION WORK WITH VEGETABLE AND FRUIT CROPS

Within the reach of every South Carolina farmer is a year 'round garden and a good home orchard. In addition, the commercial production of truck crops is of great importance in the Coastal Plains section of the state, and the production of fruits is rapidly expanding into a large farm industry in the middle and upper counties. The extension program in horticulture has been planned to meet the needs of the farmers of the state along these lines.

Improving Home Orchards

Home orchard demonstrations were conducted in all counties with the records showing an average value of products of $125.08 per farm, at an average cost of $37.35.

More Food from Home Gardens

A large part of the living of thousands of South Carolina farm families comes from the home gardens. During the year 665 home garden demonstrations were conducted by county and home demonstration agents in the 46 counties. An average of 3,900 community leaders received the monthly garden letter giving timely information on all phases of garden work.

Records further show that 5,446 families canned according to the family budget prepared by the home demonstration service, and that 3,796,496 cans of food were put up under the supervision of the home agents. In addition, 43,503 quarts of fruits and vegetables were brined, and 100,171 bushels of fruits and vegetables were stored for home use.

Complete Fertilizer Necessary for Peach Trees

Outstanding work was done by the Horticultural Division in correcting abnormalities which had developed in valuable commercial orchards from the use of ammonia alone as a fertilizer, and which threatened the life of a large number of orchards.

On selected demonstrations, the use of a complete fertilizer composed of nitrogen, phosphorus, potassium, and dolomitic limestone proved that the abnormal condition could be corrected and the trees brought back to normal productivity.

A survey of the commercial orchards of the state was made in 1934, and it was found that one-third of the orchards inspected showed this abnormal condition. The demonstrations of the Extension Service have revolutionized the fertilizer practices of commercial orchardists of the state, and thereby saved many of them from the disaster of a total loss of their bearing trees.

More Money From Truck Crops

Valuable lessons were secured from demonstrations in truck crops, which brought the farmers of the state a return of around $5,000,000 in 1935. A definite step forward was made in improving the quality of South Carolina sweet potatoes by means of improved stock and a new type of curing house. Higher yields and better quality of several main truck crops were obtained from the adoption of fertilizer and cultural practices developed through enterprise record demonstrations. The grade and pack of many important vegetables was improved, all of which factors were reflected in the most successful year for truck growers since the depression.

MARKETING FARM PRODUCTS

Frequently farm products grown by the best known production methods sell at a disadvantage because of the fact that they are poorly graded and packed or otherwise poorly conditioned before being placed on the market. This is especially true of truck and fruit crops, as well as other more specialized crops grown in the state.

The marketing work of the Extension Service included an educational program in the standardization of the grade and pack of the main truck crops of the state, peaches, Irish potatoes, sweet potatoes, and asparagus, and also many other fruits and vegetables. The cooperative marketing of poultry and eggs was continued with the greatest volume moved in several years. Much effort was given to the development of plans for more successful storage and curing of sweet potatoes.

The Division of Markets assisted in carrying out the provisions of the watermelon agreement, and also supervised the shipping point inspection service for all fruits and vegetables shipped from the state. In addition assistance was given farmers in several sections of the state in establishing marketing centers, and in finding markets for livestock, livestock products, and many other miscellaneous farm products for which there were no established marketing facilities.

Poultry Shipments Increase

Carlot poultry shipments increased from 219,738 pounds in 1934 to 608,653 pounds in 1935. From these shipments 11,950 farmers received $84,875.10 as compared with $25,810.30 in 1934.

Shipping Point Inspection

This work was supervised on 6,639 cars of fruits, vegetables, and other farm products valued at $2,147,539. This service has proved most valuable to the producers of the state, as is shown by the fact that they are using it in increasing numbers every year.

Summary of Marketing Work

The total value of products marketed with the help and under the supervision of the Extension Service amounted to $4,665,037.00 in 1935.

EXTENSION WORK WITH POULTRY

Poultry and poultry products furnish one of the most necessary and important sources of food for South Carolina farm families and, in addition, bring a larger farm income than any other class of livestock.

Extension poultry work for 1935 included demonstration flock records on poultry and turkeys, culling and flock improvement work, disease and parasite control, and educational work on feeding, sanitation, and flock management.

Poultry Records Tell of Profit

Demonstration flock records kept by poultrymen for the past eight years in cooperation with the Extension Service, showed an average income above cost of $1.44 per hen in 1935, as compared with an average income above cost of $1.67 per hen for the eight-year period. During this eight-year period, the records show that hens averaging over 150 eggs per year returned an annual income above costs of $2.27 each as compared with $1.06 for hens laying less than 100 eggs each. The records further show that during this eight-year period, heavy breeds returned an average annual income above costs of $2.02 per hen, as compared with $1.55 for the light breeds. The importance of early hatching of chicks for layers is shown by the fact that hens from chicks hatched before March 1 returned an annual income above costs of $1.93 each, as compared with $1.45 for those hatched in March or later.

Profit from Turkeys

Turkey records kept by farmers showed an average profit of $3.15 per hen for 1935.

Chicken Pox Control

Chicken pox, commonly known as "sorehead", at one time threatened poultry production in the state, and many poultrymen actually had to go out of the business on account of injury to their flocks from this disease.

During the past five years the Extension Service has conducted an intensive campaign in all counties, teaching a simple process of vaccination, which has solved this problem for poultrymen and saved the industry for thousands of farmers.

Demonstrations were conducted on 82 farms in 1935, where 21,000 birds were vaccinated. Only 300 birds died as a result of the vaccination, and no serious outbreak of the disease was reported on any of these farms.

As a result of these demonstrations thousands of poultrymen in the state are doing their own vaccinating and thus controlling the disease on their farms.

Poultry in the Live-at-Home Plan

The home demonstration service pushed a campaign for more poultry flocks on farms to furnish food for the farm family and a small income from surplus products. In 1935, 3,567 demonstrations were conducted,

involving the production of 225,123 birds. In addition 14,026 other farmers and farm women were assisted with poultry problems by these community leaders conducting demonstrations.

4-H Club Members Profit from Poultry Work

There were 107 older 4-H club boys and girls enrolled in a major poultry project extending over a period of three years. Their average income above cost in 1935 amounted to $72.39 each.

Other Poultry Extension Work

The record shows that 1,782 farmers were assisted in building or remodeling poultry houses, 3,578 received help in purchasing baby chicks, 7,799 were assisted in rearing baby chicks, and 7,350 were assisted with feeding problems.

4-H CLUB WORK

During the period from 1924 through 1935, South Carolina led all the states in the United States in percentage of increase in 4-H club enrollment. In 1924 there was an enrollment of 9,435 white boys and girls and 1,144 Negro boys and girls, or a total of 10,579. In 1935 the enrollment had increased to 18,142 white boys and girls and 8,479 Negro boys and girls, or a total of 26,621, representing an increase of 152 per cent. During this 11-year period completed demonstration records received from these 4-H clubs increased from 40 per cent to 62 per cent of all members enrolled.

Club Boys Make Good Yields of Crops

An average yield of 36 bushels of corn per acre was produced by 1,291 club boys in 1935, as compared with an average yield of around 14 bushels per acre for the state as a whole. At the same time 485 cotton club boys produced an average of 434 pounds of lint per acre as compared with a state average of 260 pounds.

4-H Club Members Grow Livestock

A total of 1,124 pig club boys grew out 1,517 pigs valued at $26,453.39, while 131 calf club members grew out 193 calves valued at $21,586.46. Poultry to the value of $14,736.92 was produced by 482 poultry club members who grew out 23,178 chicks. Fifty-nine beef calves were fed out by 53 club boys, and sold for $2,104.59.

4-H Club Boys Make Real Money

The total value of farm products grown by 4-H club boys in 1935 amounted to $215,564.86. Total costs were $104,515.04, leaving the boys an income above costs of $111,049.82.

4-H Girls' Club Work

Girls' 4-H club work was led by home demonstration agents in all counties of the state in 1935. A total of 11,186 girls was enrolled in projects including clothing, foods and nutrition, poultry, home improvement, gardening, canning, and beautification.

4-H Club Girls Improve Home Furnishings

Enrolled in work to improve the home furnishings were 1,662 girls. They improved 2,883 rooms and made 12,088 articles for their homes.

4-H Club Girls Like Clothing Projects

To young girls on the farm, the problem of clothes is an acute and vital one, affecting their attitude and outlook on life during these formative years. A total of 4,609 girls selected clothing projects and made 22,685 articles of clothing under the leadership of the agents and specialist during the year.

Foods, Nutrition and Health

Valuable training in the preparation and serving of balanced meals, and in health measures was given to 8,210 4-H club girls. These girls prepared 26,983 dishes of food, served 5,934 meals, and canned 478,412 containers of food.

Home Management

Home management projects were conducted in 17 counties with 185 older 4-H club girls participating.

4-H Club Camps Popular

A total of 7,517 4-H club boys and girls attended summer camps held under the direction of county farm and home agents in 1935. Fully 12,500 attended achievement days and rally days.

EXTENSION WORK IN AGRICULTURAL ENGINEERING

Saving the Soil from Erosion

The building and maintenance of adequate terraces and other mechanical structures for the control of soil erosion has long been one of the great problems of farmers in the hilly Piedmont section of South Carolina. County agents have spent much time laying out terraces and planning water systems on farms, and the farmers have worked hard to establish these systems, only to find that on account of a lack of suitable power and equipment, they were unable to build structures that would control the washing of land on their farms.

Then, too, farmers had not considered proper land use in connection with erosion control. Much land too steep for cultivation was planted annually to cultivated row crops until the topsoil was finally all washed away. Few farmers practiced a system of crop rotation designed to assist in the control of erosion. As a result, erosion has taken a frightful toll in the form of the fertile topsoil from the farms of the Piedmont section of the state.

Counties Sponsor Terracing Programs

Through a well planned campaign of educational publicity from the Soil Conservation Service and the Extension Service, the farmers of the Piedmont section have been made conscious of the terrific damage in progress and have fallen enthusiastically in line with the program of soil conservation.

In cooperation with the Soil Conservation Service, assistants in soil conservation were placed in 14 Piedmont counties to supervise the work of controlling erosion. The Emergency Relief Administration cooperated by furnishing 21 tractor-grader outfits which are being operated by crews trained by the extension terracing specialist to build terraces for the farmers at a definite rate of pay per operating hour. This payment is figured to cover operating expenses and amortize the equipment during its operating life.

Each farmer for whom terracing is done enters upon a land-use agreement calling for the proper rotation of his crops, the retirement of steep and badly eroded land to grass or trees, and the proper maintenance of terraces and waterways built on his farm.

During 1935 terraces and waterways were constructed on 18,884 acres of land under this program. In addition soil surveys were made on 99,889 acres of land, and cropping agreements have been made on 317 farms including 53,233 acres.

The program is only beginning in South Carolina. Thousands of farmers have caught a vision of what can be done, and county governments and cooperative groups of farmers are beginning to purchase terracing equipment. County soil conservation associations have been organized in all Piedmont counties, with a membership of farmers who are determined to control erosion and save the soils of the Piedmont.

Constructing and Improving Farm Buildings

The return of better times has been reflected in the widespread interest of farmers in improving farm homes and other farm buildings, which in many cases had reached a serious state of repair during the depression.

The Extension Service assisted 2,086 farmers in working out plans for the construction of 2,442 farm buildings, including 220 farm homes; assisted 2,132 farmers in repairing, remodeling or painting 2,692 farm buildings, 1,490 of which were farm homes; and assisted in installing lighting systems on 82 farms, water systems on 126 farms, and home appliances and conveniences on 3,233 farms.

Farm Machinery

Assistance was given by the Extension Service to 410 farmers in the adjustment and operation of farm machinery.

PUBLICATIONS AND NEWS SERVICE

The job of carrying the extension teaching message to the people through newspapers, bulletins, circulars, and over the radio falls upon the Publications Department. Informational articles of interest and bulletins are prepared by the specialists in the different lines, and are analyzed and prepared for publication by this department, which also supervises the distribution of the material.

Bulletins and Circulars

Three extension bulletins and 14 extension circulars were prepared and issued during the year.

News Distribution

Mimeographed news letters totaling 387 were issued during the year, carrying spot news and information on agricultural matters to the newspapers of the state. In addition 16 news articles were given to the Associated Press, and 60 feature articles dealing with agricultural progress and important informational material were sent out.

Newspaper articles numbering 8,040 were published by county and home demonstration agents, giving current farm news, suggestions, and announcements. In addition, 4,349 circular letters containing agricultural information were sent out by county and home agents, who also distributed 148,251 agricultural bulletins to farmers.

CONSERVATION OF FOOD

Never before, not even during the World War, had there been so much canning and storing of foods in South Carolina as in 1935. Records show 3,796,496 containers put up under the direction of the home demonstration agents, 5,446 farm families having canned by the budget worked out by the home demonstration service. In addition to the canning, 15,693 quarts of vegetables were brined according to recommendations, 100,171 bushels were stored, and 369,125 pounds of meat were cured by approved methods for home use.

These figures do not include the large amounts of vegetables put up by the county canneries from the relief gardens, though in many instances the home demonstration agents trained those in charge of the canneries.

FOODS, NUTRITION, AND HEALTH

The home demonstration clubs in 44 counties devoted much of their time to nutrition work, which included sponsoring hot lunches for school children and planning, producing and conserving a food supply that would adequately meet the nutritional needs of their families.

Through the program of hot lunches for school children, 191,597 children enrolled in 2,545 schools received a hot dish as part of their school lunch during at least the three coldest months of the year. Better school attendance, gain in weight of the pupils, improved school work, and fewer discipline problems were directly credited to this work.

A total of 4,069 families produced food according to the budget worked out by the home demonstration service. These families kept records from which valuable lessons have been learned on the problems of a balanced food supply for the farm families of the state.

EXTENSION WORK IN HOME FURNISHING

Farm women are making great progress in improving the attractiveness and convenience of farm homes. They wanted demonstration work in home furnishing and asked for it. As a result work along this line was conducted in 489 communities with 1,254 farm women

improving the convenience of arrangement of their kitchens, and 3,318 families improving the selection of furniture and making 1,930 pieces of furniture. Also 2,018 rooms were arranged, 610 storage pantries, 394 bedroom closets, 211 bookcases, and 525 children's storage places were built, all resulting in an estimated saving of $21,345.51 to the families participating in the work.

EXTENSION WORK IN HOME MANAGEMENT

Farm women welcomed demonstration work that would help them with the problems of home management. This work was conducted in 383 communities, with 1,527 families obtaining labor-saving equipment, 1,478 families assisted in soap-making, and 4,266 families making home-made equipment. Estimated savings from this work amounted to $12,-184.35.

EXTENSION WORK IN CLOTHING

The time is passing when a woman or girl from the country can be spotted by her clothes. The fact that many farm women now dress as modishly and attractively as their city sisters reflects no small amount of credit on the work of the home demonstration agents and clothing specialists, who for a number of years have worked hard to assist the farm women and girls with their problems of clothing.

Clothing work was conducted in 36 counties of the state, with 2,835 farm women following recommendations as to the making and care of clothing, renovation of old hats and clothing, testing fabrics, studying clothing labels, and learning the points that go to make up quality and serviceability. Home dyeing and dry-cleaning were also valuable skills learned by these housewives.

FARM WOMEN LEARN MARKETING

Some phase of marketing work was carried on by home demonstration agents in 43 counties in 1935, reaching 13,997 farm homes and selling farm produce to the value of $302,933.87. Thirty farm women's markets were in operation. Twenty-eight home agents gave assistance in marketing poultry and eggs.

CULTURAL STUDIES

While the home demonstration program more than justifies its being in the amount of real cash value it brings to the rural families of the state, it does not confine itself strictly to the material things of life. Farm life even at its best includes a certain amount of monotony and drudgery, and farm women and girls especially take a keen delight in the cultural studies as well as the practical. Included in these studies were such features as flower arrangement, picture study, music study and appreciation, and wholesome recreation.

NEGRO DEMONSTRATION WORK

Demonstration work with Negroes was conducted by local Negro farm agents in 15 counties having a high percentage of Negro population, and in 13 such counties by Negro home agents. The work con-

sisted mainly of demonstrations among Negro farmers and farm women of live-at-home practices in farming and home-making, including the production of food and feed crops, the economical production of cash crops, the feeding and management of livestock, the preparation of balanced meals for the family, and sanitation.

Farm Financing

Eight hundred and forty Negro farmers were assisted in making credit statements and applications for production loans, 249 were assisted in making farm or other debt adjustment, and 1,004 were aided in reducing cash expenses through the farm production of a larger part of their food. One hundred and forty-seven families from towns were assisted in getting reestablished on farms, and 168 families on relief were assisted in becoming self-supporting.

Food and Feed Demonstrations

Negro farmers conducted 186 corn demonstrations under the leadership of the local agents and averaged 20 bushels per acre. Wheat production among the Negro farmers has steadily increased under the AAA programs, and 62 demonstrations in wheat production were carried out.

Demonstrations in growing legumes and forage crops are listed as follows: soybeans, 12; cowpeas, 113; velvet beans, 24; vetch, 12; and lespedeza, 11.

Cotton and Tobacco Work

A total of 122 cotton production demonstrations and 10 tobacco demonstrations was conducted by Negro farmers.

Live-at-Home Program

In 1935 the Negro farmers of South Carolina made the greatest effort in years to produce and conserve sufficient food and feed on their farms. The acreage taken out of cotton production gave them an opportunity to increase their plantings of food and feed crops, and thousands took advantage of this opportunity. This resulted in more milk cows, hogs, and poultry on the farms of Negroes in the state, and will eventually bring to them improved health conditions resulting from a more balanced diet.

Foods and Nutrition

Negro home agents conducted work in foods and nutrition in 189 communities, with 796 demonstration meals planned and served. School lunches were served in 844 schools in cooperation with relief agencies. Year-round gardens, were grown according to recommendations by 3,021 families. Over 250,000 containers of vegetables, fruits, and meats were canned by 4,918 families.

Health and Sanitation

One of the most important projects of the Negro home demonstration agents was that of health and sanitation. The average colored

family stands greatly in need of improvement of conditions along this line. The following summary gives results in the field:

Sanitary toilets installed	1143
Homes screened	121
Persons using preventive measures for typhoid fever, etc.	3547
Number of homes painted or whitewashed	1129
Number of yards cleaned	7825
Number of flower yards planted	4862
Number of clinics held	201
Number of lectures given	461
Number of health programs	268
Number of wells covered	692

REPORT OF BOARD OF VISITORS

To the Board of Trustees
The Clemson Agricultural College

The Board of Visitors for the year 1936 submits this as its report and recommendations as the result of a visit and inspection of Clemson Agricultural College made on May 13 and 14, 1936.

After a very thorough and detailed inspection tour of the physical plant at Clemson College, the Board of Visitors for 1936 met and organized by the election of Mr. Wyndham M. Manning of Sumter as chairman, and W. G. Finley of York as secretary.

Mr. W. O. Coleman of Greenwood was duly elected a hold-over member for the 1937 Board of Visitors.

The Board of Visitors for 1936 submits the following recommendations which in its unanimous opinion will subserve the most urgent needs of Clemson Agricultural College in the near future:

1. We recommended that the salaries and perquisites of the professors and instructors of Clemson College be placed on a basis comparable with other institutions in order to enable the college to retain and secure the best possible qualified men for the faculty of the college.

2. We have also examined with interest the records of the college with reference to the great numerical difference in the number of students entering as freshmen and the number in the same class graduating. The number of men in the graduating class for 1936 is 178. When this class entered college four years ago the number enrolled was 377, showing that over 50 per cent of the men entering college failed to graduate. We suggest that a like comparison of the records of other classes be made, and believe that as large a proportion of failures will be shown. We recommend that the authorities of the college make a more thorough and rigid examination of the qualifications of the applicants for the freshman class to the end that only worthy students who are qualified and earnestly desirous of securing a college education be admitted.

All the state colleges are being maintained at a heavy expense to the taxpayers of the state, and we believe that through a more rigid scrutiny of the qualifications and records of applicants for admission a large number of loafers and idlers who do not appreciate their opportunities of securing a college education, could be eliminated. We realize that some worthy men for financial or other satisfactory reasons are required to withdraw from school, but in all state colleges there is a large number of students who are wasting their opportunities, and to whom we do not think the taxpayers of the state are under any obligations to furnish a college education. If any appreciable number of this class of students can be eliminated, there will be a large resulting saving available for the needs of the remaining students. This same condition exists in all state

colleges, and a considerable amount of the taxpayers' money can be saved or utilized to better advantage, if the qualifications of the applicants are more closely scrutinized.

3. We also recommend that a new fireproof hospital building be erected to replace the present hospital which is totally inadequate to care for the present hospital needs, this building to be designed to care for the prospective growth of the institution. The present hospital building is of wooden construction and is a veritable fire trap. In case of fire it would be practically impossible to remove pneumonia patients or very ill patients from this building. The present hospital building could be converted to other uses, but we consider it totally unfitted and highly dangerous to be used as a hospital.

4. We also recommend that a new modern building, equipped with the latest machinery, be erected for the textile department to replace the present one, which is totally inadequate for the needs of this department.

Our reason for making the above recommendation for the textile department is that the graduates of this textile department generally locate in South Carolina, and are gradually filling an existing need in the textile industry for educated, trained, and experienced executives. The textile industry is the largest industry in South Carolina, and its future will be largely determined by the type, character, and qualifications of its executives. We believe that those departments, who graduates locate in South Carolina, and whose careers and work contribute to the development and upbuilding of the state, should receive the most consideration. For example, the Department of Electrical Engineering at Clemson College is a very excellent one, but an examination of the records will show that these young men who are educated at the state's expense practically have to leave the state to secure employment, so it is impossible for the taxpayers to receive any benefit from the money spent on their education.

5. We also recommend an additional laboratory for the Chemistry Department.

6. We also recommend that adequate equipment be installed and provision made to make complete soil analyses for the people of the state.

7. We point out the need of a full Diesel engine in the Engineering Department, and urge that one be acquired as soon as possible.

8. We wish to commend the splendid landscaping work now being done on the college grounds, which is adding so much to the appearance of the campus, and recommend its continuance.

9. We also wish to congratulate President Sikes and the faculty in charge on the successful year's work just completed, and as South Carolinians we are very proud and gratified to observe the splendid progress being made by Clemson College to carry out her alloted work and place in the educational system of the state.

Respectfully submitted,

BOARD OF VISITORS OF CLEMSON AGRICULTURAL COLLEGE FOR THE YEAR 1936
W. M. Manning, Chairman
W. G. Finley, Secretary

Organization of the Board of Visitors:
Wyndham Manning, Chairman
W. G. Finley, Secretary
W. O. Coleman, Hold-over member for 1937

Membership:
Robert Able, Chester
Mason Brunson, Florence
W. O. Coleman, Greenwood
Gist Finley, York
Benjamin Freeman, Pickens
John W. Geraty, Yonges Island
W. P. Hamrick, Columbia
John D. Harris, Greenville
J. C. Holler, Anderson
Wyndham Manning, Sumter
Richard Watson, Greenville

REPORT OF SECRETARY OF FERTILIZER BOARD

Dr. E. W. Sikes
President
The Clemson Agricultural College
Clemson, South Carolina

Dear Sir:

I beg to submit herewith report of the Board of Fertilizer Control for the year beginning July 1, 1935, and ending June 30, 1936.

The work of the fertilizer inspection this year has been quite heavy, more so than usual, owing to the extreme weather conditions existing during the fertilizer season. The season was much longer drawn out than any previous year since we have been in charge and required more time of the inspectors. The demand by farmers for inspectors to draw samples from their fertilizer has been the heaviest since we have been here. Our records this year show by far the greatest number of samples to be analyzed probably in the history of the fertilizer analysis department. The bulletin recently published also shows a greater number of deficiencies in fertilizer analysis than in any previous year since we have been in charge.

We used this year the same force of inspectors as the previous year and these men travelled the state continuously during the fertilizer season and have rendered very efficient services, as is evidenced by the number of violations reported and samples drawn.

It is encouraging to note that the fertilizers used by our farmers are gradually getting on a higher plane. That is, they are using higher grade guaranteed analysis fertilizers. The low grades are gradually disappearing and the increase in the higher analyses is very evident. However, as above stated, the deficiencies this year were a great deal more numerous than in previous years. Especially was this evident in the potashes, as practically 50 per cent of the samples drawn from potash were deficient below the guaranteed analysis.

The receipts this year were very few dollars in excess of last year. We received this year $153,697.43 as against $153,452.15 for the previous year. The penalties assessed for the past season for violations of the law amounted to $130.00.

Summing up, we beg to state that the feeling of cooperation existing between this department, the farmers, and the industry is excellent and we appreciate this attitude on the part of the public.

Respectfully submitted,

J. H. WOODWARD, Secretary
Board of Fertilizer Control

REPORT OF STATE VETERINARIAN

Dr. E. W. Sikes
President
The Clemson Agricultural College
Clemson, South Carolina

Dear Sir:

The following report covering the activities of the Clemson College Livestock Sanitary Department in cooperation with the Bureau of Animal Industry, U. S. Department of Agriculture, for the fiscal year ending June 30, 1936, is respectfully submitted.

The functions of this department, as is well known, are to assist livestock owners in the control and eradication of all contagious, infectious, and communicable diseases of livestock and poultry, also to cooperate with other states, as well as with the Federal Government, in the control of the movement of livestock and poultry to prevent the importation of infected animals and poultry into our state.

The principal projects of this department during the past year are as follows:

TUBERCULOSIS ERADICATION

On October 31, 1935, all cattle in the State of South Carolina six months of age and over had been tested for bovine tuberculosis and the infected animals found, which were less than one-half of one per cent, were slaughtered in accordance with the plan, and we are very glad to state that at this time the entire area of the State of South Carolina is recognized as a Modified Accredited Area by all other states and the U. S. Bureau of Animal Industry. This accomplishment is not only appreciated by the cattle owners but an indication of the status is reflected in the great movement of cattle that are being shipped from this state for breeding and dairy purposes. The control and eradication of bovine tuberculosis is not only of great advantage to cattle breeders of our state but it assures the consumers of dairy products that it is safe to use such products from South Carolina dairy herds and family cows.

HOG CHOLERA CONTROL

We are very glad to state that the hog cholera situation in the state is very satisfactory. There has been no appreciable increase in the amount of infection during the past year yet there has been an increased interest manifested on the part of the hog owners in having their hogs treated against cholera. While this increase in the treating of hogs against cholera may be due to the increased price, yet we feel that the hog owners are appreciating more and more the value of the preventive treatment. From reports received there has been an increased swine production, consequently there is an increased demand upon this department for service in rendering assistance in the treating of hogs against cholera.

LABORATORY

As has been reported in the past, this class of work continues to be of great advantage to the livestock industry of the state. During the past year 97,227 specimens have been examined from all classes of livestock including poultry. In all instances the owners were informed as to the proper procedure for the treatment of the conditions. The following summary indicates the activities during the past year:

Cattle	59,870
Chickens	37,080
Swine	11
Sheep and goats	133
Horses and mules	7
Turkeys	21
Cat	1
Quail	6
Pigeons	12
Dogs	84
Miscellaneous	2
TOTAL	97,227

U. S. BUREAU OF ANIMAL INDUSTRY COOPERATING

The U. S. Bureau of Animal Industry cooperates with the State of South Carolina in certain projects, namely: Tuberculosis Eradication and Hog Cholera Control. (The Eradication of Cattle Fever Ticks has been completed.)

On July 1, 1934, the U. S Bureau of Animal Industry established a plan for Bang's disease elimination in cattle in this state. Since this plan was inaugurated and by the close of June 20, 1936, they will have expended approximately $150,000 in the elimination of this disease in cattle, the greater portion of this sum being paid to owners of cattle who accept the plan and then have the cattle slaughtered that were found to be infected with Bang's disease (infectious abortion). Veterinarians throughout the state are employed in this work. In further connection with this we wish to advise that this expenditure on the part of the federal government did not require an expenditure on the part of the state, the only exception being the use of our laboratory equipment. Technicians are employed by the federal government to conduct the work.

SERVICES

For the past several years we have employed practicing veterinarians on a per diem basis to assist this department in the control and eradication of contagious and infectious diseases and this plan is still in effect and, as in the past, it has proven to be very satisfactory. Under this plan we are enabled to render service to livestock owners in any section of the state on very short notice.

Respectfully submitted,

W. K. LEWIS, State Veterinarian.

REPORT OF CHIEF CHEMIST

Dr. E. W. Sikes
President
The Clemson Agricultural College
Clemson, South Carolina

Dear Sir:

The following report of the analytical work of this department on commercial fertilizers, waters, etc., done for the Board of Fertilizer Control, and for the citizens of this state, and for other departments of the college, during the year ending June 30, 1936, is respectfully submitted.

During the season of 1935-1936, 1,567 official samples of fertilizer were analyzed, classified as follows:

Complete fertilizers	1346
Special mixtures (phosphoric acid and ammonia)	8
Superphosphates	30
Superphosphates with potash	4
Ammonia with potash	9
Cottonseed meals	17
Nitrate of soda	33
Potash salts	70
Dried blood	3
Fish	5
Sulphate of ammonia	9
Untreated phosphate materials	12
Basic slag	3
Calcium nitrate	5
Miscellaneous	13
TOTAL	1567

This is 284 or 18.12 per cent more than last season.

In addition to the above official samples, 31 unofficial samples consisting of farmer samples, home mixtures, and fertilizing materials were examined.

Of the 1567 samples considered in this discussion, 134 or 8.58 per cent were found deficient beyond the limits allowed by law.

In addition to the 134 samples deficient beyond the limits allowed under law, there were 541 or 34.52 per cent found deficient below guaranteed analysis in one or more ingredients as follows:

In available phosphoric acid	92
In ammonia	161
In potash	119
In available phosphoric acid and ammonia	16
In available phosphoric acid and potash	9
In ammonia and potash	39
In ammonia, phosphoric acid, and potash	5
TOTAL	541

Also 388 samples were found deficient in water-soluble ammonia; 354 deficient in available water-insoluble ammonia; and 40 deficient in both water-soluble and water-insoluble ammonia.

During the last few years much colloidal or soft phosphate rock, unacidulated, has been offered for sale in the state under the assumption that much of the phosphoric acid content would become quickly available. Field tests have shown that where the soil is acid some of the phosphoric acid becomes available during the ordinary growing season. However, if the soil is only slightly acid, neutral, or alkaline, none of the phosphoric acid will become available. If the consumer knows the soil to be acid, this material may be used with profit provided the price is not too high.

This season it is apparent that some mixers have used this collodial phosphate with superphosphate in mixed goods, increasing the total phosphoric acid, hoping to get credit for much of the phosphoric acid as available. However, in most of the cases the insoluble increased to such an extent that the available fell far below their guarantee. This, perhaps, accounts for the large number of samples deficient in available phosphoric acid.

At the present writing, the work on the basicity and acidity has not been completed, but so far the indications are that the greater percentage of the mixed fertilizers are basic or near neutral showing that the manufacturers and mixers have recognized the demand for non-acid-forming fertilizes.

A ruling of the Board of Fertilizer Control requires that manufacturers and mixers shall state on a tag attached to each bag of fertilizer whether or not it is neutral, acid, or non-acid-forming.

However, as this ruling did not go into effect until December 1, 1935, many samples received prior to that date were not guaranteed acid or non-acid-forming.

The availability of water-insoluble ammonia has been determined on all brands of mixed fertilizers and all were found to be above 80 per cent. The Board of Fertilizer Control ruled that the availability of water-insoluble ammonia should be 80 per cent, based on the amount guaranteed. This ruling was made in conformity to the standard as set by the A. O. A. C. A tolerance of 50 pounds per ton equivalent to calcium carbonate was allowed for either acidity or basicity.

This season we have been confronted with the fact that a large per cent of the potash salts were deficient under the law. Many requests were made by manufacturers and mixers for a portion of our sub-samples in order to check our results. In each case, however, their results agreed with ours. The Lindo-Gladding method with Kraybill modifications as adopted in the November, 1935, meeting of the A. O. A. C. has been used for all potash work this season. This modification of the method was supposed to give higher results than the original method.

In general, the mechanical condition of the mixed fertilizers was good. However, a few indicate that the mechanical condition was such that it would be impossible to apply it uniformly to the soil.

In addition to the fertilizer work, 17 waters and 14 miscellaneous samples, consisting of marls, insecticides, whiskeys, etc., were analyzed, and two human stomachs and seven materials suspected of being poisonous were examined toxicologically.

Respectfully submitted,

B. F. ROBERTSON, Chief Chemist.

REPORT OF STATE CROP PEST COMMISSION

Dr. E. W. Sikes
President
The Clemson Agricultural College
Clemson, South Carolina

Dear Sir:

The activities of the South Carolina State Crop Pest Commission are chiefly regulatory and its aim is to prevent, as far as it is possible, the introduction into South Carolina of destructive insect pests and plant diseases that do not occur here and to prevent the spread of such pests and diseases as are already within the borders of the state.

These activities are performed by the enforcement of certain rules and regulations promulgated under an Act passed by the General Assembly in March, 1912, requiring inspection of plants and plant products in this and other states that are likely to carry destructive pests and diseases.

In summing up the work of the State Crop Pest Commission for the past year, it is interesting to note the scope of this work in the state. Some type of inspection work was done in each of the 46 counties.

When it is realized that in a large number of cases plantings required two or three inspections, it is readily appreciated that quite a volume of work is involved.

As in past years, the work of this commission has been educational in nature, and we have proceeded along cooperative lines with the growers of the state. We feel that the people generally realize that the efforts of this commission are helpful rather than coercive in nature, and that our efforts are intended for their protection and to promote their welfare.

Respectfully submitted,

H. P. COOPER, Director.

NURSERY INSPECTIONS

In accordance with an Act requiring all nurseries to be inspected at least once each year, these inspections were begun in June and completed in August. One hundred and three established nurseries were inspected, in addition to many smaller plantings that cannot yet be classed as nurseries. These nurseries are located in 35 counties throughout the state and comprise approximately 800 acres. This is a slight decrease in acreage from last season, due principally to the smaller acreage planted to narcissus bulbs.

Prices for nursery stock have been considerably better during the past year and marked improvement has been noted in the condition of the stock found in the nurseries of this state. No serious pests were found in any of the nurseries and it was observed that our recommendations for the control of the common pests have been followed very closely; consequently, the plants were found to be in a very healthy condition.

As a safeguard to the purchasers of nursery stock the regulations of the commission require that a permit tag showing that the plants have been inspected and found apparently free of injurious insect pests and plant diseases must accompany each package, bundle, or bale of nursery stock transported. For this purpose last season 4,065 permit tags were issued. This state, as in previous years, does not nearly supply the demand for nursery stock, therefore, many hundreds of dollars worth is shipped into South Carolina each year, greatly adding to the problems of the commission in its efforts to prevent the dissemination of injurious plant pests.

Followng is a list of the South Carolina nurseries inspected during the season 1935-36:

Name and Address of Nursery	Kind of Stock	Acreage
Aiken Growers of Ornamentals, Aiken	Ornamentals	2
Allen, Walter, Summerville	Ornamentals	1/2
Anderson, Mrs. O. D., Anderson	Ornamentals	6
Atkinson, F. W., Rt. 4, Augusta, Ga.	Youngberry	2
Bittersweet Nursery, Chesterfield	Ornamentals	1/2
Bluebird Nursery, Easley	Ornamentals	4
Borden Nursery, Rembert	Ornamentals	1
Boxwood Gardens, Society Hill	Ornamentals	1
Briggs' Nursery, Travelers Rest	Ornamentals	1
Buckfield Plantation, Yemassee	Narcissus	400
Bush, James C., North Augusta	Perennials	1/20
C. F. and H. Nursery, Andrews	General	4
Cain, Miss Caroline P., Pinopolis	Daffodils	3/4
Clarke, Mrs. W. W., Lynchburg	Ornamentals	1/20
Campbell, W. A., Sheldon	Narcissus	4
Campobello Nursery, Campobello	General	1/4
Cantrell, W. B., Liberty	Ornamentals	1
Cannon, Mrs. Leila, Tigerville	Ornamentals	1/10
Carolina Floral Nursery, Charleston	Ornamentals	10
Cason, J. M., Lykesland	Strawberry	1/2
Cherokee Gardens, 2227 Wheat St., Columbia	Ornamentals	1/20
Chrietzberg, H. F., 462 Peroneau St., Spartanburg	Iris	1/10
Cox, J. R., Greeleyville	Pecan	1
Culler, Mrs. J. W., Jr., Orangeburg	Ornamentals	1/4
Dailey's Nursery, Clinton	Ornamentals	6
Davis, John O., Nursery, Ware Shoals	Ornamentals	1 1/2
DeLoache, Mrs. Heidt, Estill	Ornamentals	1/10
Dibble Nursery, Orangeburg	Ornamentals	2 3/4
Duncan Nursery, Greenville	Ornamentals	1
Edwards Nursery, Darlington	Ornamentals	5 1/2
Eidson, Mrs. A. L., Johnston	Bulbs	1/20
Elm Abode Nurseries, 1207 Hampton St., Cola.	Ornamentals	8
Evergreen Nurseries, Conway	Privet	1/4
Evergreen Nursery, Camden	Ornamentals	3/4

Name and Address of Nursery	Kind of Stock	Acreage
Evergreen Nursery, Rembert	General	1/4
Fant's Greenhouses, Anderson	Ornamentals	3/4
Fletcher, Mrs. Jasper, McColl	Ornamentals	1/10
Flowerland Nursery, 125 Meeting St., Charleston	Ornamentals	1
Gaffney Greenhouse, Gaffney	Ornamentals	1/4
Geraty, W. C., Yonges Island	Narcissus	25
Georgia-Carolina Nursery, Trenton	General	1
Gibson, Mrs. R. H., Hampton	Ornamentals	1/4
Gillison, Mrs. Paul, Seneca	Perennials	1/10
Greenville Nursery Company, Greenville	General	35
Green Gate Gardens, Bennettsville	Iris	1
Green Bros. Nursery, Elloree	Ornamentals	1
Guion, Mr. and Mrs. L. I., Lugoff	General	4
Harmon, Mrs. Ethel, Saluda	Ornamentals	1/5
Harris, Mrs. Hunter, Union	Ornamentals	1/20
Harrison, Joseph M., Rt. 1, Charleston	Narcissus	25
Holley's Evergreen Nursery, Aiken	Ornamentals	2 1/4
Howell-Gillespie Nursery, Taylors	Ornamentals	1
Hyer, Kinyon, Navy Yd., Rt. 2, Charleston	Ornamentals	1/20
Jahnz, Hugo, Summerville	Ornamentals	1/2
Jordan, H. C., Aiken	Perennials	1/20
King, Mrs. Z. E., Liberty	Ornamentals	3/4
Lockwood, A. L., Anderson	Gladiolus	1
Liberty Nurseries, Liberty	Ornamentals	
Lucas, Miss Florence LeNoble, Pinopolis	Daffodils	1/2
Lybering, E. L., Sumter	Ornamentals	2
McGee Nursery, Rt. 8, Anderson	General	1/4
Miller Bros. Nursery, Roebuck	Ornamentals	7
Mitchell, Chas. S., Seabrook	Narcissus	3
Morningside Nursery, Newberry	Ornamentals	1
Moss, Chas. A., Spartanburg	Ornamentals	1
Newton, R. K., Tatum	Privet	1/4
Oaklawn Nurseries, Mayesville	Ornamentals	5
Out Post Nurseries of S. C., Charleston	Ornamentals	1/2
Owen Brothers, Aiken	Ornamentals	1 3/4
Palmer and Harvin, Sumter	General	1/4
Palmetto Floral Nursery, Charleston	Ornamentals	3 1/4
Palmetto State Nursery, Florence	Ornamentals	8
Pecanola Nursery, Cameron	Pecan	1/4
Piedmont Nurseries, Gaffney	General	2
Pinehurst Nursery, Summerville	Ornamentals	2
Rawlinson, J. W., Rock Hill	Ornamentals	1/4
Rock Hill Nursery, Rock Hill	General	8
Rosewood Greenhouses, Columbia	Ornamentals	1/4
Santee River Nursery, Lanes	General	1/2
Senn, Mrs. L. E., Mayo	Perennials	1/20
Shannon Farm Nursery, Jefferson	Ornamentals	1

Name and Address of Nursery	Kind of Stock	Acreage
Simon's Nursery Co., Inc., Rt. 2, Johns Island	Ornamentals	3
Skinner's Nursery, 29 Broad St., Charleston	Ornamentals	1
Smith, F. M., North	Strawberry	1/4
Stateburg Forest Nursery, Sumter	Forest	1
State Forest Tree Nursery, Camden	Forest	2
Summerville Floral Nursery, Summerville	Ornamentals	3
Talley's Nursery, Florence	General	1/4
Taylor's Nursery, Greer	General	10
The Garden Nursery, Camden	General	
Three Trees Flower Farm, James Island	General	1/2
Thimble, Farm, Garden and Nursery, Latta	Ornamentals	1/4
Tuck, Mrs. Oscar, Westminster	Achemine	1/10
Twixtboro Nursery, Darlington	Ornamentals	3 1/4
Utopia, Greenwood	Ornamentals	6
Watson's Pecanwood Nursery, Orangeburg	Pecan	15
Watson's Nursery, 3200 Elmwood Ave., Columbia	General	1
Whitaker Nurseries, Union	Ornamentals	1/2
Witherspoon, Miss P. F., Spartanburg	Ornamentals	1/20
Wolfe, Russell S., Orangeburg	Ornamentals	4
Woodward, Mrs. A. W., Rt. 6, Aiken	Ornamentals	4
Wyly, O. S., Walhalla	Cedrus Deodora	1/4

INTERSTATE REGULATIONS

The interstate movement of nursery stock is still of first importance in South Carolina due to the fact that the nursery industry in this state has not yet developed sufficiently to supply the demands. The industry in South Carolina is slowly expanding, however, as may be noted from the gradual increase in the number of nurseries.

The commission, as in previous years, requires every out-of-state nursery which wishes to do business in South Carolina to file, previous to shipment, a duplicate copy of their current year's nursery inspection certificate. This certifies that the nursery has been properly inspected and found free of insect pests and plant diseases. During the season 1935-36, 33 nurserymen in Tennessee, 23 in Texas, 23 in Georgia, 22 in Ohio, 19 in New York, 12 in Alabama, 10 in North Carolina, eight in Florida, eight in Illinois, seven in New Jersey, six in Iowa, five in Connecticut, four each in Maryland, Minnesota, Mississippi, and Pennsylvania, three in Virginia, two each in Wisconsin, Missouri, Michigan and California, one each in Arkansas, Louisiana, South Dakota, Delaware, and Massacnusetts, a total of 211 nurserymen signified, by the filing of these certificates, their intention of shipping nursery stock into this state. To these nurserymen were issued 20,867 South Carolina permit tags. It is not hard to realize that shipments coming in from nurseries scattered over such a wide territory must be closely guarded to prevent the introduction of undesirable pests.

In addition to the above requirements inspectors of this commission when possible, with the limited force and funds available, have made inspections at destination of the larger shipments from out-of-state nur-

series. We have met with splendid cooperation from the nurserymen of the various states and have found them willing to comply in every respect with the laws of this state.

As a further precaution, the commission, as in previous years, requires nurserymen of other states to file with this office duplicate invoices of all nursery stock shipped into South Carolina, in order that if the occasion should arise any shipment from any particular nursery may be located.

The value of these invoices lies in the fact that if a pest should escape detection when the regular inspection is made and should be found later the location of every shipment can be found and prompt eradicative measures taken if necessary.

GREENHOUSE INSPECTIONS

The greenhouse inspections were made during November and early December. The greatest variety of plants are being grown at this season of the year, and since the temperatures prevailing in greenhouses are practically ideal for the reproduction of certain insects and plant diseases it is at this time that they can be most easily detected. The more common insects such as aphids, mealy bugs, scale insects, midges, red spiders, and leaf spots of various kinds were found lightly infesting plants in some of the greenhouses. The operators of the greenhouses in most cases are quite familiar with the control of the common pests, therefore, very little difficulty is encountered in keeping them under control.

No additional greenhouses were added to the list durng the past season. Thirty-seven greenhouses with an approximate area under glass of 580,000 square feet were inspcted and certified, as were, also, many out-door plantings adjacent to these houses.

Following is a list of the floral establishments inspected during the year:

Name	Address
Anderson Floral Company	Anderson
Blackman Greenhouse	Darlington
Bush's Greenhouses	North Augusta
Camden Floral Company	Camden
Carolina Floral Company	Charleston
Carolina Garden	North Augusta
Clinton Flower Shop	Clinton
Drake's Home of Flowers	Greenville
Darlington Greenhouses	Columbia
Dodd's Flower Shop, 204 N. Main Street	Greenville
Eastside Greenhouse	Clinton
Eauclaire Greenhouses	Columbia
Eison, Inc.	Columbia
Fant's Greenhouses	Anderson
Floral Hill Gardens	Mt. Pleasant
Gaffney Greenhouses	Gaffney
Glen Ayers Floral Company	Spartanburg

Name	Address
Gillian, Henry, 49 Pinckney Street	Abbeville
Harling, O. L.	Greenwood
Hite Floral Company	Aiken
Hollywood Greenhouses	McColl
Laurens Floral Company	Laurens
Magnolia Floral Company	Charleston
Marion Floral Gardens	Marion
Moss, Chas. A.	Spartanburg
Palmetto Greenhouses	Florence
Palmetto Floral Company	Charleston
Palmer and Harvin	Sumter
Raysor's Florist	Greenville
Reid Flower Shop	Rock Hill
Ridge Greenhouses, The	Leesville
Shandon Greenhouses	Columbia
Summerville Floral Nursery	Summerville
Talley's Flowership	Florence
Wales Garden Greenhouses	Columbia
Wessel's Florist	Aiken
Weinold, Floral Company, 811 Augusta Street	Greenville

INSPECTION OF SMALL HOME PLANTINGS

As stated in last year's report, calls for this type of inspection have greatly increased during recent years. Where the quantity of material offered for sale has warranted we have made inspections of all such plantings though most of them are too small to be classed as regular nurseries. In many cases where only a few shipments are made each year, we have thought it most economical to have the parcels shipped to this office for inspection and forwarded from here to destination. Approximately 25 parcel inspections were made during last season and more than 50 inspections of small home plantings. Most of the stock shipped from these home plantings is small lining-out stock and is sold at a nominal price.

In furtherance of the commission's policy of helpfulness and cooperation there is issued to these shippers of parcel post packages of plants small stickers instead of the larger and much more expensive permits necessary on express shipments. These stickers carry the same wording as do the express tags and are the purchasers' assurance that the plants do not harbor injurious pests.

Sixteen thousand of this type of permits were issued last season.

REGISTRATION OF NURSERY DEALERS

While the old fruit tree agent is much less in evidence than in former years there are still some who wish to act as agents and dealers for nurseries both in this and other states. As has previously been the custom, this commission requires all such dealers and agents to execute an affidavit giving the names and addresses of the nurseries from which they expect to purchase stock for shipment to South Carolina. This is done in order that dealers may buy only from qualified nurseries.

BULB INSPECTIONS

Although there is now no federal quarantine requiring inspection of narcissus bulbs, practically all states classify such bulbs as nursery stock, so if our growers are to be able to make shipments into other states it is necessary that all such plantings be inspected. Narcissus bulbs are subject to attack by several insect pests and an eel worm, necessitating two inspections in order to certify them. One of these inspections is made in January while the bulbs are growing in the field. This is known as the field inspection, and at this time 480 acres were examined.

The second or storage inspection is made during July and August after the bulbs have been dug and cured. Inspections and certifications last season covered approximately 45,000,000 bulbs. So far our growers have enjoyed freedom from any of the pests to which this crop is subject.

To these growers last season were issued 7,400 permit tags. The list of commercial growers in South Carolina is as follows:

Name	Address
Buckfield Plantation	Yemassee
W. A. Campbell	Sheldon
W. C. Geraty Company	Yonges Island
J. M. Harrison	Route 1, Charleston
Russell S. Wolfe	Orangeburg
Miss Caroline P. Cain	Pinopolis
Louis LeConte	Lykesland
Mrs. Louis I. Guion	Lugoff
Charles S. Mitchell	Seabrook

In addition to narcissus bulbs there are several growers of amaryllis bulbs. These bulbs receive the same inspections as is given nursery stock and are shipped under the same type of permit.

SWEET POTATO INSPECTIONS

As far as available funds would permit we made the customary three inspections for as many as was possible of the growers of sweet potato plants and sweet potatoes for seed purposes. The sweet potato industry in South Carolina is of such importance that we believe careful consideraton should be given to the control and prevention of diseases as well as to the production of high quality. There are several destructive diseases of the sweet potato occurring in both field and storage which cause enormous losses each year. Much of this loss can be prevented through proper selection, rotation, and treatment. The law requires that all growers selling plants or potatoes for seed must have their crop inspected three times; namely, once while the potatoes are growing in the field, once while they are in storage, and once in the plant bed. As far as it has been possible to do so, we have inspected all such properties. We have noted the diseases decrease greatly during the years that these regulations have been in force, and it is an unusual thing for one of our growers to have plants so heavily infected that they have to be condemned.

We believe that if all the commercial sweet potato growers would use the same precautionary measures as our plant growers, potatoes of much better quality would be available on the markets. During the past few years Louisiana potatoes have brought much higher prices on the northern markets than South Carolina potatoes chiefly because of their uniformity to type and color and freedom from disease. The Extension Service in furtherance of their efforts to help the farmers of the state produce products of the highest quality imported a carload of these potatoes and distributed them throughout the commercial sections. These potatoes were inspected by a member of this commission on their arrival in South Carolina, before they were distributed to the growers.

Last season we made 327 inspections for growers located in 29 counties. During the season 9,047 permit tags were issued for both interstate and intrastate shipments of sweet potato plants.

Below is a list of the sweet potato plant growers in this state for last season:

Name	Address
Anderson County	
Ellison,	Belton
Aiken County	
Branch, E. W.	Warrenville
Dicks, Mrs. F. P.	Windsor
Woodward, A. W.	Rt. 6, Aiken
Allendale County	
All, Mrs. F. R.	Ulmers
All, J. B.	Ulmers
Aughley, J. D.	Fairfax
Brabham, Otis	Allendale
Deer, L. R.	Ulmers
Colleton County	
Antley, J. C.	Cannadys
Guess, E. L.	Round
Guess, W. H.	Round
Smoak, Guy L.	Round
Utsey, A. C.	Round
Calhoun County	
Pearlstine, J. T.	St. Matthews
Cherokee County	
Green, C. P.	Chesnee
Chester County	
Byars, Alvis	Lowrys
Robbins, S. L.	Chester
Chesterfield County	
Talbert, F. M.	Rt. 1, Cheraw
Talbert, J. N.	Rt. 3, Patrick

Name	Address
Clarendon County	
Butler, I. S.	Manning
Mellette, A. T.	Manning
Rast, F. M.	Manning
Snyder, W. T.	Manning
Timmons, J. H.	Manning
Darlington County	
Galloway, Chas. W.	Hartsville
Dorchester County	
Burbage, L. M.	Summerville
Dukis, A. C.	St. George
Harberson, L. M.	St. George
Jamison, D. T.	Summerville
Florence County	
Andrews, W. A.	Florence
Johnson, A. B.	Lake City
Stokes, C. E.	311 Church St., Florence
Greenwood County	
Davis, N. H.	Greenwood
Greenville County	
Batson,	Greenville
Batson, J. W.	14 Pinckney St., Greenville
Loftis, C. B.	Taylors
Moore, T. H.	Rt. 1, Greenville
Piedmont Plant Co.	Rt. 1, Greenville
Georgetown County	
Platt, J. D.	Georgetown
Hampton County	
Ayers, Thos. J.	Furman
Buckner, L. W.	Rt. 1, Pineland
Brunson, Feldon	Gifford
Bolton, Mrs. J. H.	Scotia
Causey, J. T.	Furman
Causey, Mrs. W. J.	Furman
Collier, H. H.	Scotia
Crapse, G. H.	Lena
Crapse, H. T.	Lena
Crosley, G. E.	Scotia
Davis, Jesse	Scotia
Davis, W. H.	Furman
DeLoach, A. J.	Scotia
DeLoache, John	Gifford
DeLoache, Mrs. M. J.	Furman
DeLoach, W. O'Neal	Pineland
Goethe, J. L., Jr.	Furman
Goethe, J. S.	Scotia
Goethe, Mrs. Ruth	Scotia

Name	Address
Goethe, D. B.	Scotia
Gohagen, Mrs. R. J.	Scotia
Gohagen, J. L.	Furman
Gohagen, G. W.	Furman
Henderson, L. P.	Scotia
Hanna, Mrs. Edward H.	Gifford
Kittles, T. J.	Garnett
Long, Mrs. L. A.	Furman
Leightsey, W. Henry	Estill
Mason, Mrs. R. V.	Scotia
Pender, D. S.	Scotia
Peoples, Mrs. M. L.	Scotia
Prince, A. I.	Scotia
Prince, C. E.	Scotia
Rickenbacker, Henry	Scotia
Russell, Frances P.	Scotia
Small, Robert	Scotia
Tuten, G A.	Rt. 1, Estill
Tuten, M. P.	Furman
Tuten, Mrs. Hattie	Furman
Tuten, W. E.	Rt., Estill
Tuten, W. H. and G. T.	Rt., Estill
Tyler, Mrs. R. M.	Scotia
Vaughn, Patrick M.	Gifford
Horry County	
Smith, M. R.	Conway
Jasper County	
Grover, John	Ridgeland
Jaudon Bros.	Tillman
Welborn, S. W.	Tillman
Laurens County	
Patterson, J. Talmadge	Lanford Station
Shell, Jack	Laurens
Stone, Hamp	Clinton
Lexington County	
Clackley, A. C.	Swansea
Long, Mrs. J. Hampton	Gilbert
Lucas, J. R.	New Brookland
Lucas, S. W.	New Brookland
Rawl, Walter	Gilbert
Lee County	
Bell, Ralph	Rt. 2, Hartsville
Durant, J. E.	Lynchburg
McDowell, M. G.	Rt., Lynchburg
Newberry County	
Epting, R. E.	Pomaria

Name	Address
Oconee County	
Brown, Mrs. Arthur	Walhalla
Khoury, E.	Seneca
Marret Farm and Seed Co.	Westminster
Morgan, John H.	Rt. 2, Walhalla
Powell, J. J.	Rt. 2, Walhalla
Powell, L. J.	Rt. 2, Walhalla
Yarid, S. K.	Seneca
Orangeburg County	
Dantzler, T. M.	Parler
Eveans, P. C.	Elloree
Gramling, T. L.	Orangeburg
Hutto Bros.	Vance
Jackson, J. M.	Rt. 4, Orangeburg
Kennerby, J. S.	Cordova
Murden, A. J.	Rt. 5, Orangeburg
Norris, F. K.	Eutawville
Smith, J. A.	Holly Hill
Smith, L. W	Holly Hill
Way, M. C.	Holly Hill
Pickens County	
Perry, C. O.	Rt. 2, Easley
Perry, W. L.	Rt. 2, Easley
Perry, Robert	Rt. 2, Easley
Raines, A. P.	Rt., Easley
Suddeth, J. C.	Easley
Sutherland, W. H.	Pickens
Richland County	
Holt, D. T.	Wateree
Spartanburg County	
Jackson, F. S.	Campobello
Pearson, J. A.	Wellford
Williamsburg County	
Guess, J. N.	Lanes
York County	
Ashe, A. A.	Rt. 4, York

APIARY INSPECTIONS

In accordance with the Bee Disease Act of March, 1922, requiring inspection of all apiaries of beekeepers who sell queen bees, beekeeping equipment, and package bees, we examined during the past season 1,100 colonies and issued 175 permits for the movement of package bees and 1,200 queen cage permits for the movement of queen bees. As stated in previous reports South Carolina is not primarily a honey-producing state but the market for package bees and queens is increasing from year to year. Queens are shipped as far west as California and north to Canada. Shippers of package bees find their best market in the North where winter

mortality is heavy, and to the big orchardists where proper pollination is of great importance. South Carolina's climate is ideal for early brood rearing and the bees can be gotten into shape much quicker than is possible in the North. One Northern beekeeper has established an apiary in South Carolina mainly for the purpose of supplying his needs in the North. He now has in South Carolina 500 colonies of bees and 1,000 nuclei.

Some American foul brood was found in Greenwood and Pickens counties last year, and one colony in Richland county was found infected with Para-foulbrood. The brood diseases, at least, do not seem to be increasing and we believe that if sufficient funds were available for crop pest and disease work that the serious bee diseases could be eradicated.

None of the brood diseases were found in the apiaries of the queen and package bee shippers.

COTTON SEED REGULATIONS

The commission has continued its policy of requiring the shippers of cotton seed for planting purposes to file with this office an affidavit showing that the seed are practically free of anthracnose and wilt. After these affidavits are filed, if they are found to meet the requirements, permit tags to accompany each shipment are issued to the shippers. For this purpose last season 34,125 tags were issued.

CABBAGE AND TOMATO PLANT REGULATIONS

During the past season there were inspected 65 acres of cabbage plants and 35 acres of tomato plants. No serious diseases were found though root knot was found in isolated sections infesting both cabbage and tomato plants.

This year some of the tomato plant growers are requesting certification of tomato plants, in order that they may compete with growers from one of our neighboring states. This means that more inspections will have to be given and that more drastic precautionary measures will have to be taken in the prevention of diseases, but we believe that it is a service that should be given all growers who desire it.

INSECTICIDE AND FUNGICIDE REGULATIONS

The Act providing for the registration of insecticides and fungicides sold in the state has been enforced as in previous years. No new developments came up during the year in the enforcement of these regulations.

IRISH POTATO INSPECTIONS

Last year the State of Michigan promulgated regulations prohibiting the shipment of Irish potatoes into that state unless they had been inspected and certified as being free from infestation of the potato tuber moth. This insect is quite injurious to this crop in some of the states along the Atlantic seaboard, but it has not yet been found infesting potatoes in South Carolina. Last year approximately 125 acres were inspected for those growers who made shipments into Michigan.

JAPANESE BEETLE

The Japanese beetle, an insect first discovered in this country in 1916, has continued to spread slowly in all directions since that time. Each year the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture, in cooperation with the inspection service of the states, carries on considerable scouting and trapping in areas not known to be infested in order that outlying infestations may be eradicated when possible. As stated in last year's report 88 beetles were taken in traps at Greenville. From the number captured this would seem to indicate an established infestation. In order to prevent the possible establishment of a federal quarantine which would necessarily inconvenience the property owners in and around Greenville it was deemed advisable that some 16 acres of soil should be given the arsenate of lead soil treatment in an effort to eradicate the pest from this particular area if possible. The Crop Pest Commission does not have funds for emergencies of this kind, so an appeal was made to the Governor for funds to purchase 16,000 pounds of arsenate of lead, the amount required for the treatment. The state was asked to furnish the arsenate of lead and the necessary labor for applying, the federal bureau to furnish supervision and machinery. The necessary funds could not be obtained during the fall which is the proper time for making treatments, but did become available early in the spring. It was the concensus of opinion of both federal and state entomologists that the spring treatment, though not as efficient as the fall treatment, should be given. Consequently, the arsenate of lead was purchased and applied to 16 acres during the period April 22 to May 5. The Greenville soil treatment was unique in several respects. The laborers assigned to help the federal employees were convicts under guard. In addition this was the first time that an injunction had been obtained to prevent the application of arsenate of lead to private property. Wholehearted cooperation was received from the city of Greenville, and after the party had been induced to withdraw the injunction, the work was completed.

During the past season trapping was again done in South Carolina, 4,300 traps having been placed as follows: Charleston, 800; Aiken, 100; Orangeburg, 200; Sumter, 200; Columbia, 800; Greenwood, 200; Florence, 300; Anderson, 300; Greenville, 800; Spartanburg, 400; Rock Hill, 200. Trapping in South Carolina was concluded on July 22. Eleven beetles, eight males and three females, were captured over a rather widely separated area in Charleston, and 30 beetles (17 males and 13 females) in Greenville. The Greenville infestation is in the same area as that of last year. What action is to be taken regarding this year's trapping has not yet been decided upon.

PHONY PEACH DISEASE

This disease characterized by certain abnormalities of the tree and fruit was first reported in South Carolina during the summer of 1930 when preliminary scouting work was carried on by inspectors of the Bureaus of Plant Industry and Plant Quarantine of the U. S. Department of Agriculture in cooperation with inspectors of the South Carolina State Crop Pest Commission. Since 1931 no very intensive inspections have

been made due to lack of funds, both federal and state. Some inspections, however, have been made each year since 1930 and each year some few trees infected with the disease have been found.

In the early fall of 1935 Emergency Relief Funds to the amount of $63,521.76 were set aside for the eradication of escaped and abandoned peach trees in South Carolina. This was thought to be a worthy project, not only for the eradication of phony peach disease, but for aid in the control of injurious insect pests also. Preparations, therefore, were immediately begun for the organization of crews to work in the most important peach growing counties. The work began September 1, 1935, as follows: Greenville county, two crews consisting of 40 men; Spartanburg county, two crews consisting of 40 men; Saluda and Chesterfield counties, crews of 20 men each; and Aiken, Edgefield, Richland, Lexington, York, and Laurens counties, crews of 10 men each. The number of men varied from time to time but work has been continued to the present time. These men are under the direct supervision of Mr. Robert W. Sanders with headquarters at Spartanburg. Mr. Sanders has cooperated very closely with this commission. This project met with approval of the peach growers from the very beginning and it is possible that the work will be continued during the season 1936-37. In fact, approval has been given for the continuation of the work for the six months' period beginning July 1. The following table shows the number of kinds of trees removed up to June 30. The figures cover trees of any size from whips to bearing age.

Kind and Number of Trees Removed

County	Abandoned		Escaped		Phony
	Properties	Trees	Properties	Trees	Trees
Aiken	103	12,945	174	85,380	
Cherokee	623	6,028	743	57,148	
Chester	208	4,748	170	26,477	
Chesterfield	170	39,775	87	68,577	
Edgefield	118	5,151	32	9,639	
Fairfield	38	2,326	52	8,989	
Greenville	601	24,371	1,034	980,122	
Greenwood	348	4,236	400	138,194	
Kershaw	139	12,154	156	51,240	
Lancaster	30	2,448	27	3,001	
Laurens	634	24,362	1,438	1,146,231	
Lexington	31	16,908	30	28,841	
Newberry	68	15,511	68	20,735	
Richland	46	9,719	23	25,381	
Saluda	308	113,480	878	206,663	38
Spartanburg	1,466	79,548	1,679	921,571	
Union	49	1,696	125	74,510	
York	581	13,534	1,379	385,097	
TOTAL	5,561	388,950	8,495	4,237,796	38

In April of this year there was again held in Fort Valley, Georgia, a school of two weeks' duration at which state leaders and inspectors of the various states were given intensive training in definitely determining the phony disease in the field with the view of returning to the states and during the summer making a thorough examination of all commercial and home orchards. Mr. M. B. Stevenson of this office and four inspectors were designated to attend this school, and on May 1 actual inspections began in South Carolina. Under the direction of Mr. Stevenson as state leader there has been given the home and commercial orchards this year by far the most thorough inspection that we have yet been able to give since the finding of the first diseased trees in 1930. Mr. Stevenson has had associated with him in the inspection work this summer Mr. S. J. Ethridge of the Bureau of Entomology and Plant Quarantine whose wide and varied experience with phony peach inspections has been of very great value. In addition to Mr. Stevenson and Mr. Ethridge a crew of six inspectors have been continuously at work since May 1. Following is a tabulation of the inspections of home and commercial orchards through June 30 with the number of phony trees found.

Counties	Number of properties inspected	Number of trees inspected	Number of phony trees
Abbeville	2	1,275	0
Aiken	16	13,114	1
Anderson	15	2,890	0
Barnwell	2	5	1
Cherokee	1	1,000	0
Chester	9	13,810	0
Chesterfield	75	188,255	5
Colleton	1	20	3
Edgefield	129	68,955	19
Greenville	79	79,880	1
Kershaw	33	59,728	0
Greenwood	17	3,180	1
Lancaster	7	8,600	0
Laurens	19	50,450	4
Lexington	62	54,551	0
McCormick	6	3,437	0
Newberry	3	410	0
Pickens	8	4,275	0
Richland	17	19,988	1
Saluda	136	147,969	54
Spartanburg	234	398,829	12
Sumter	5	25,555	0
Union	6	15,700	0
York	78	92,558	1
TOTAL	958	1,254,434	103

The above figures cover both commercial and home plantings. While 103 phony trees were found through June 30, this is a very small per cent of infection considering the number of trees inspected. Due to the insidious character of the disease and its ability to do great damage to the rapidly growing peach industry of this state, should it become firmly established, we believe that every effort should be continued to eradicate this plant pest.

REPORT OF DIRECTOR OF EXPERIMENT STATION

Dr. E. W. Sikes
President
The Clemson Agricultural College
Clemson, South Carolina

Dear Sir:

Attached is a summary of the 49th Annual Report of the South Carolina Agricultural Experiment Station. The research work of the various departments is briefly summarized.

A lack of suitable soil on the Experiment Station property for the production of tobacco has prevented the Pee Dee Experiment Station from developing adequate research work on tobacco production problems. After several unsuccessful attempts to rent suitable land for tobacco experiments, it was decided to purchase 156 acres of land to be used primarily for experimental work with tobacco. The acquisition of this farm, with the aid of the tobacco office of the Bureau of Plant Industry in the Department of Agriculture at Washington, D. C., has enabled the station to initiate a comprehensive series of experiments on tobacco production. In order to expand this research work on tobacco, the construction of additional tobacco barns and barn and stables for feed and mules will be necessary.

Tobacco is one of our most important crops and the Experiment Station should be in a position to investigate the important problems in its production. It is estimated that 15 to 20 thousand dollars special appropriation will be required for tobacco and other investigational work on the farm secured for tobacco research work. Such an additional appropriation should make it possible to develop a tobacco research program which will more adequately serve the needs of our tobacco growers. Our most pressing need at the present is additional facilities for experimental work with tobacco. The experimental work on animal, general field crops, fruit, and vegetable production has proceeded in a very satisfactory manner during the fiscal year.

Respectfully submitted,

H. P. COOPER, Dean and Director.

AGRICULTURAL ECONOMICS

During the year considerable progress has been made in the projects in Agricultural Economics. Most of the studies deal with problems which at the present time are uppermost in the minds of farmers, due to the emphasis being attached to the economic and social aspects of agriculture under the New Deal.

Agricultural Adjustment

The most important and far-reaching project in Agricultural Economics during the past year was the research which had for its purpose the establishment of a basis for agricultural adjustment. This work was

carried on cooperatively by the AAA, Bureau of Agricultural Economics, and the South Carolina Experiment Station. The staff members in Agricultural Economics spent a great portion of their time on this project during the year. The final report was submitted to the Washington office in September. This report resulted in recommendations for agricultural adjustments in South Carolina by type-of-farming areas. The recommendations were based on careful research and the judgment of a selected committee of specialists in research and extension at Clemson College. This study was carried on concurrently by each state in the United States, and the South Carolina report elicited favorable comments by the officials of the U. S. Department of Agriculture.

Study of Types of Farming

A bulletin dealing with types of farming in South Carolina has been reduced to manuscript form and is almost ready to be submitted to the printer. The bulletin presents a clear and full analysis of the basic factors affecting the agriculture of the state. Four major problems are isolated: soil erosion, fertility maintenance, tenancy, and size of farms. It would appear that the size of farm should be increased over that which now prevails in the state. Unquestionably, the type of soil, erosion conditions, and efficiency in the use of production factors should be given more consideration in working out sound farming practices on many farms.

Economics of Hog Production

During the year Bulletin 305, An Economic Study of Hog Production and Marketing in South Carolina, was issued, which emphasized the rather close connection between changes in corn acreage and changes in the number of hogs on South Carolina farms. In turn, corn acreage is affected by changes in cotton acreage, and thus the entire production system is shown to be interrelated. It was pointed out in the bulletin that South Carolina is a deficit corn and hog producing state, and that an increase in hog production should be made if the home needs of pork are to be supplied by local production.

Farm Management Study

During the year the project in farm management, conducted cooperatively with the Bureau of Agricultural Economics, U. S. Department of Agriculture, showed considerable progress. Survey records were obtained from 50 representative farms in Saluda county, and from 45 in Horry county. The data are now being analyzed, and will furnish a systematic and thorough picture of farm organization and management in these two areas.

Occupational Mobility

The studies in mobility and farm tenure have been advanced to the final stages. An important finding brought out is that negro tenants move less than white tenants. This result has important implications, as has also the finding that owner farmers move on the average about

every eight years, and tenant farmers every three or four years throughout their employed years. However, among owner farmers the majority of the moving is done in early life, while among tenants moving tends to be incessant throughout life. Ownership of a farm seems to give stability, while tenancy appears to furnish little incentive to stability. In analyzing the amount of moving 1,830 South Carolina farmers had done, it was found that 84.4 per cent of the moves were made in the county in which the farmers lived at the time the survey was conducted (1933). This indicates that, while farmers do a great deal of moving, most of it is done within the home county.

Grade and Staple of Cotton

The project in which the grade and staple of South Carolina cotton is being investigated shows that during the last year the staple of South Carolina cotton improved in length. A higher proportion of the longer staples of cotton is produced in South Carolina than in most of the other states. It appears that this state has a comparative advantage in producing cotton of good staple length.

Taxation

The studies in taxation have shown considerable progress during the past year. A 10 per cent sample of the individual income tax returns for South Carolina for the year 1934 has been analyzed. Of those filing returns, 19.0 per cent escaped all taxes, that is, income taxes and all other taxes. In 1932 there were 71.0 per cent of individuals filing income tax returns who escaped income tax, while in 1934 only 38.0 per cent escaped such taxes.

Many variations have been discovered in the amount of income taxes paid by different groups. Certain groups with larger incomes pay much less income tax than other groups with lower incomes.

Farm Mortgages

Field work is now in progress in which farm mortgages, land transfers, and farm taxes are being studied in 18 counties. This has been initiated within the past year. The study should reveal findings with reference to the source of farm credit, the amount of farm mortgage indebtedness, the amount of foreclosures, etc. The land transfers study will serve to develop indexes as to the activity of real estate markets, and will show the trend in land values since 1917.

SOILS, FIELD CROPS, AND FERTILIZERS

The Federal Bankhead-Jones appropriation for fundamental research has enabled us to expand our agronomic research programs. One associate agronomist, Dr. G. B. Killinger, has been added to our staff during the fiscal year. Dr. T. C. Peele, who was studying certain soil erosion problems in cooperation with the Federal Soil Conservation project located in Spartanburg and Greenville counties, has resigned to accept an appointment with the Federal Soil Conservation Service. Dr. Frank Moser has been appointed to succeed Dr. Peele.

ADDITIONAL CONCRETE PLATS

The movement of soil due to erosion is a very serious problem in conducting fertilizer and crop experiments on the rolling soils of the Piedmont section. In order to secure more satisfactory data, small plats bordered by concrete walls are used for various fertilizer experiments. The plats are approximately 1/400 of an acre in size. There are 78 such plats which have been in use since 1928. Two hundred and eight additional plats have been constructed for experimental work on soil fertility problems. Local top soil will be used for some of these plats. Certain major soil types from various sections of the state will be used for the other plats. By transporting the various soil types to Clemson and testing them under fairly uniform conditions, we should secure data on the compartive value of various soil types for various crops under different cultural treatments.

Study of Soil Types Used in Production of Certain Truck Crops

In order to determine the soil types commonly used in the production of certain truck crops, it was necessary to make a survey of the truck crop regions in the Savannah river section of the Coastal Plain. Such information will be very valuable in selecting a location for the new Truck Experiment Station which is to be established in that vicinity.

Pasture Investigations

The soil conservation program on the hilly soils of the Piedmont area of the state emphasizes the importance of reducing the row crops and increasing the broadcast crops and the pastures. If our soils are to be conserved, it will be necessary to work out a more satisfactory land use program. The importance of pastures has not been generally recognized. Since relatively little cash is received directly from the pastures on the average farm, very little consideration is given to the actual value of the pasture. In many cases the pasture gives more profitable return per acre than any other crop.

It has been found that it is possible to secure good pasture on much of our soil by the use of lime and phosphorus. On the steep pastures, terracing and contour furrowing are effective in conserving water and increasing the production of the pasture during dry seasons.

Source of Nitrogen Studies

Since nitrogen is one of the very important limiting factors in the production of crops on most of our soil, a large number of experiments have been conducted to determine the relative value of different sources of nitrogen used in fertilizers. In many of the earlier tests on certain soils, it was found that the protein or natural organic sources of nitrogen were superior to some of the soluble mineral sources, such as sodium nitrate and ammonium sulfate. These results were accepted generally by farmers, and there was an increased demand for organic or insoluble forms of nitrogen. Since nitrate nitrogen may leach from the soil very readily, and ammonium sulfate leaves an acid residue in the soil, it is

very easy to account for the results secured in some of the experiments.

Since the introduction of cheap synthetic sources of nitrogen, it has been necessary to make an intensive study of the whole nitrogen fertilizer problem in order to determine the relative value of all the available sources of fertilizer nitrogen. It was formerly believed that the superiority of the organic sources of nitrogen was due to the form of the nitrogen. Recent experimental results show that there is little difference in the relative value of fertilizer nitrogen where the other limiting factors in the growth of plants are supplied.

There are four important factors to consider in determining the relative growth responses to be expected from the use of fertilizer nitrogen: first, availability; second, content of minor plant nutrients; third, leachability; and fourth, effect on soil acidity. Where any particular material is used in such a manner as to avoid the difficulties arising from the above mentioned properties, there is little difference in the growth response of crops from the use of various nitrogen fertilizer materials, with the exception of some of the materials which are toxic to plants on certain soils.

The results from recent research work makes it possible for farmers to utilize the cheaper soluble sources of nitrogen which do not leach readily, and get just as good results as can be secured from the use of high-priced insoluble sources of nitrogen. Many of the progressive farmers have already accepted these findings and are receiving excellent results from the use of the cheaper sources of water soluble nitrogen. These farmers will have a big advantage over those who demand a fertilizer relatively high in high-priced insoluble nitrogen.

The addition of magnesium and manganese where necessary and the use of non-acid-forming fertilizers on acid soils makes it possible to secure good results from the use of the cheaper forms of water soluble nitrogen on most of our crops. The Southeastern states use large amounts of nitrogen fertilizers, and the Southern farmer should learn how to use the material that will give a maximum return for his investment in fertilizer materials.

Variety Tests

The common varieties of field crops are tested each year to determine the varieties best suited to various sections of the state. The introduction of new varieties make it necessary to conduct variety tests each year.

From 20 to 35 varieties were included each year in both cotton and corn tests. A number of varieties are tested each year in the variety tests: oats, wheat, rye, and barley. Variety trials of soybeans, cowpeas, velvet beans, and lespedeza are also conducted.

PLANT PHYSIOLOGY AND PLANT DISEASES

Studies of Growth and Development of Cotton Buds and Bolls

The study of the effect of specific mineral nutrients on the growth and fruiting of cotton begun in 1934 was continued in 1935. In pre-

liminary experiments, boll and leaf shedding were noted with plants grown in nutrient solutions containing varying amounts of magnesium. Two similar nutrient solutions were used in 1935, the only difference being that one contained four times the magnesium and somewhat more than four times the sulfur of the other.

More shedding of the usual type and a greater abortion of very young fruit buds (squares) occurred on the high magnesium plants than on the low magnesium plants. With the solutions used, the plants grew normally when the acidity, expressed as pH, varied from 3.8 to 5.0. Abnormalities appeared when these values became greater or less. The solutions were changed entirely at intervals of 10 days to two weeks and fresh solutions at the rate of seven liters daily were kept flowing into each jar containing a plant. Decided changes in the acidity occurred in some of the jars, however, in rather short periods of time indicating rapid and unequal absorption of the ions of the solution.

The high magnesium plants produced more top and root growth at first, but finally the low magnesium plants were ahead. More bolls were also retained by the low magnesium plants.

Seedling Diseases of Cotton

The treatment of cotton seed with various compounds has been tried experimentally for several years in an effort to improve the stands of cotton, especially in wet, cool seasons. The results, on the whole, showed an appreciable increase in the number of plants per acre from treated seed, though in several tests no such increases were noted. It is believed that the clue to the erratic behavior of seed treatment has been found, and tests on a much larger scale were conducted this season. Plantings of eight lots of seed, each receiving four different treatments, were made in Richland, Florence, Calhoun, Colleton, Aiken, Chester, Spartanburg, and Oconee counties. One acre was planted at each location and accurate counts were made of germination and seedling survival. Every lot of seed had been previously tested in the laboratory for the percentages of healthy and infected seed. The organisms present in and on the infected seed were known. The effect of seed treatments on the germination of the seed and on seedling losses are given below:

	Per cent of germination			Per cent of Seedling loss	
Planting	A	B	C	A	B
Not treated	19	38	46	65	34
Dusted with					
2 per cent Ceresan	38	48	52	24	26
Delinted	55	50	64	32	32
Delinted and dusted with					
5 per cent Ceresan	55	74	71	28	29

Planting "A" was made in late March and the seed germinated during cool wet weather. The "B" planting was made in early April when conditions were more favorable The results under "C" are for

seed which germinated under favorable conditions after the rains of June, although the seed had been planted for some time. The effectiveness of the seed treatments in improving stands was greatest with poor seed and was considerably less with two-year old seed that showed high germination and healthy seedlings when tested in the laboratory. Our results indicate that, as a whole, the poor stands in most sections of the state are due to the planting of seed of low germination. Germination tests on samples of seed from 100 farmers throughout the state showed only 38 per cent of healthy or non-infected seed. An average of 10 per cent of the seed was infected by the anthracnose fungus which is a sufficient reason for many poor stands. Conditions such as this in the seed of our most important crop raise the question whether some scheme of seed certification may not be advisable.

Studies of the resistance of cotton seedlings of various varieties to the anthracnose fungus indicate that two varieties now grown in the state are very resistant and several other moderately so. The most significant feature is the fact that one of the resistant varieties is a cross between a susceptible and a resistant variety.

Further hybridizations may produce other valuable commercial varieties which are resistant to anthracnose and thus enable us to reduce the frequent losses of stand. It is also significant that these resistant varieties grow well during cool weather and are, therefore, desirable for early planting where boll weevils are usually destructive.

Variation in Cotton Fiber Length and Distribution

The staple length of cotton in general has been improved in the state during several seasons but little is known concerning the relative merits of varieties in producing a uniform staple or maintaining this uniformity under varying seasonal conditions. Fineness of the fibers is also an important factor in the quality of the yarns obtained. A study of 19 varieties during three seasons has shown some significant variations and indicates that if we are to produce "quality" cotton we should not only select a variety for length of staple but should also know something of its ability to maintain the uniformity of distribution of the various lengths, and its fiber weight or "fineness" in favorable and unfavorable growing seasons.

In general, the fibers produced later in the season are shorter, though four varieties in 1933 and 1934 produced lint of the same length both early and relatively late. One of these varieties has fairly long staple, two have staple of intermediate length, and one has distinctly short fibers. Two of these varieties, however, showed a decided lack of uniformity in the percentage of fibers in the classes nearest the normal staple length. Three of the varieties are considered the most variable of the 19 varieties studied, as measured by the three factors: percentage of fibers in the classes nearest the normal staple length, percentage of fibers 10/16 of an inch and less, and the percentage of irregularity.

The variety wth the longest fibers also has the finest fibers but the variety with shortest fibers does not produce the coarsest fibers.

Vine Crop Disease Investigations

Studies of the diseases of cucurbits were initiated this year in the new trucking area with the establishment of a temporary field station at Fairfax. The occurrence and severity of the several diseases of watermelons cucumbers, and cantaloupes and their seasonal development in relation to weather conditions were observed. Preliminary experimental trials involving the use of certain seed treatments and spray and dust applications were made.

The unusually dry weather during the latter part of April and May practically prevented the destructive development of diseases upon cucurbit crops. Neither the downy mildew, a fungous leaf spot disease of cucumbers and cantaloupes, nor the angular leaf spot, a bacterial disease of the foliage and fruit of cucumbers, became widespread until the harvest of these crops was completed. Watermelon wilt, a soil-borne disease, was present in nearly every field, where it took its usual toll of from less than one to about five per cent of the hills. The gummy-stem blight disease of watermelons as well as certain fungous leaf spots of minor importance were present and apparently injurious, but under the existing climatic conditions were not really troublesome.

The light showers during the early part of June and the middle of July were sufficient to mature a good watermelon crop but failed to spread the anthracnose disease, which is usually a limiting factor in watermelon production. Anthracnose developed abundantly, however, following the heavy rains in early August, after the harvest season was practically over. The season was a very favorable one for the grower.

Laboratory and greenhouse studies of some of these diseases are under way at Clemson College with the view of furthering our knowledge of their behavior under controlled conditions and of contributing to a better understanding of the methods of control.

ANIMAL HUSBANDRY

The research work with livestock has continued to furnish information which can be profitably used by the farmers of the state. The use of this information will reduce the costs of production and increase the profits made by livestock feeders.

The Berkshire Herd

The Berkshire herd of the college was started on the show circuit in the fall of 1935. After one show the entire herd was sold for a good price. The show animals are being replaced by others of our own breeding and it is expected that another show herd will be ready for the circuit in the fall of 1937.

Digestion Trials with Swine

Eleven hogs were fed rations of corn and protein supplements of flame dried Menhaden fishmeal, steam dried Menhaden fishmeal, tankage,

or meat and bone scraps. Weights and chemical analyses were made of the feeds consumed and the feces collected. The coefficients of digestibility that were determined indicated that there was not a marked difference in the digestibility of the rations compared.

Fishmeals and Tankages as Protein Supplements for Fattening Hogs in Dry Lot

Steam dried Menhaden fishmeal, flame dried Menhaden fishmeal, tankage, and meat and bone scraps were compared as protein supplements for fattening hogs that were receiving a full feed of white corn in dry lot. The daily gains, and the feed cost of 100 pounds gain, indicate that for dry lot feeding the flame dried Menhaden meal was most satisfactory. Meat and bone scraps, steam dried Menhaden meal, and tankage followed in the order named.

Fishmeals and Tankages as Protein Supplements for Fattening Hogs on Green Forage

Sardine meal, steam dried Menhaden fishmeal, flame dried Menhaden fishmeal, tankage, and meat and bone scraps were compared as protein supplements for fattening hogs that were being full fed corn and grazed on green rye.

A study of the daily gains and feed costs obtained during the first year of this test indicates that the supplements may be ranked in the following order: First, sardine meal; second, steam dried Menhaden meal; third flame dried Menhaden meal; fourth, tankage; and fifth, meat and bone scraps.

Green Summer Forages for Fattening Hogs

Green soybeans, cowpeas, Pearl millet, and sorghum were compared as forage crops for fattening hogs that were receiving a ration of corn and fishmeal fed free choice.

As in previous tests, green soybeans and millet were of approximately equal value and produced faster and cheaper gains than the other forages used. The hogs grazing cowpeas made the slowest and most expensive gains.

The hogs were slaughtered at a local packing house. Carcass gradings and five fat measurements were taken. The gradings from all the lots were unusually good.

Winter Forages for Fattening Hogs

Barley, rye, rape, and oats were compared as green winter forages for hogs receiving corn and fishmeal fed free choice. There was little difference in the value of these forages as judged by the rate and cost of the gains made by the hogs.

The results of several years' work with winter forages for fattening hogs have recently been published in Experiment Station Circular 54, Winter Forages for Fattening Hogs.

Cottonseed Meal and Hulls for Fattening Steers

This is a study to determine the most profitable method of getting fattening steers on a full feed of cottonseed meal when cottonseed hulls are used as the roughage.

Thirty-one steers were divided into three groups. The first group was started on one pound of cottonseed meal, the second group on two pounds of cottonseed meal, and the third group on four pounds of cottonseed meal. Each group was divided into three sub-groups. The cottonseed meal fed to these sub-groups was increased at the rate of one-half, one, and two pounds per steer, per week until a rate of one pound of cottonseed meal per 100 pounds of live weight was reached.

The group of steers starting on two pounds of cottonseed meal made the most rapid and economical gains. The weekly increase of one pound of cottonseed meal per steer was the most profitable where the steers were started on either two or four pounds of cottonseed meal.

Cottonseed Meal and Hulls Compared with Corn and Alfalfa Hay for Fattening Steers

Twenty steers averaging approximately 700 pounds in weight were divided into two lots. The first lot received all the cottonseed hulls they would consume and one pound of cottonseed meal for each 100 pounds steer weight. The second lot received all the alfalfa hay they would consume and shelled white corn at the rate of one pound for each 100 pounds steer weight.

The steers on each ration made approximately the same daily gain and required the same amount of concentrates for 100 pounds of gain. The roughage requirement for 100 pounds of gain was higher in the cottonseed meal lot. The price of feeds made the use of the cottonseed meal and hull ration more economical.

At the close of the feeding test these cattle were shipped to the U. S. Research Center at Beltsville, Maryland, where complete carcass studies were made. These studies did not show any appreciable difference in the carcasses of the steers fattened on the different rations.

Flax Husks Versus Cottonseed Hulls for Wintering Purebred Hereford Heifers

Thirteen purebred Hereford heifers from the college herd were divided into two lots and fed for 56 days as follows:

Lot I received an average daily ration of 17.8 pounds of cottonseed hulls and 2.57 pounds of cottonseed meal.

Lot II received an average daily ration of 17.8 pounds of flax husks and 2.57 pounds of cottonseed meal.

The flax husk lot made an average daily gain of 0.93 pounds and the cottonseed hull lot an average daily gain of 1.02 pounds per day.

Sheep Performance in Early Spring Lamb Production

This test involves a study of the Corriedale, Tunis, Hampshire, and Southdown breeds of sheep. It also includes a study of progeny from Tunis-Hampshire crosses, and Tunis-Southdown crosses.

The object of the test is to determine and improve the capacity of sheep for early spring lamb production, including the profitable production of lamb meat and wool.

Weights are taken every 14 days on all sheep and lambs. Birth dates and birth weights are recorded. The weights on fleeces are recorded annually. Samples of wool are taken from each sheep just before shearing and all wool samples are carefully graded. Length and strength of fiber are recorded.

So far, data have been secured from 105 ewes and 91 lambs, but further work will be necessary before conclusions can be reached.

A Genetic Study of the Inheritance of the Early Lambing Character

This project has been in progress since 1933. Tunis rams are being crossed on Southdown and Hampshire ewes. The reciprocal crosses of Hampshire and Southdown rams on Tunis ewes are also being made. Twenty-nine crossbred lambs have been kept from the 1936 lamb crop.

Considerable further work will be necessary before it can be determined to what degree the early lambing character is inherited.

DAIRYING

The new dairy barn, constructed to replace the old plant which was destroyed by fire, was put into operation for the first time on September 23, 1935.

This new plant offers many new possibilities for research in methods of preparing feeds, study of temperature control in handling dairy products, the use of the milking machine as compared with hand milking, and the management of cattle.

The Combine Milking Machine

A study of the response of the individual cow to the milking machine was carried out early in December. The average length of time required to milk, as determined from 50 cows for nine milkings each, was five minutes and 18 seconds. To strip with the machine by hand massaging the udders required an additional 56 seconds. This time was not changed to any extent by the amount of milk produced or by fore milking before the machine was attached to the udders. Many operators leave the machine on the udders 10 minutes or longer at each mailking. This study with cows milking from 7.8 to 18.2 pounds per milking indicates that this is excessive, causing a slowing down of the milking process and may be the cause of some of the injurious effects to the cows' udders which have resulted from machine milking.

Proved Bulls

Through the cooperation of Klondike Farms of Elkin, North Carolina, the proved Guernsey bull, Langwater Royal Oak, has been secured to head our Guernsey herd. With Observer King Onyx, a proved Jersey bull, and Sir Bess Ormsby Fobes 34th, a proved Holstein bull, at the head of our Jersey and Holstein herds, a proved sire is now available for each breed of dairy cattle carried in our herds.

Establishing a Bermuda Pasture

In February, 1933, a small area of one and one-half acres of land which had previously been in cultivation became available for use for permanent pasture. At the time it was planned to establish a pasture on this area, no Bermuda or other vegetation was present. The land was turned with a two-horse breaking plow. A heavy application of manure was distributed over the freshly plowed land. One ton of dolomitic limestone per acre was then added, after which clumps of Bermuda roots were scattered by fork from wagons at about three feet intervals. The land was then double disked with tractor disk harrow. Two hundred pounds of 16 per cent superphosphate per acre was then broadcast over the area. At this point, white sweet biennial clover, alsike clover, crimson clover, red clover, white Dutch clover, herd's grass, meadow fescue, Italian rye grass, and timothy were seeded at the rate of four pounds of each for the area, and common lespedeza and Kobe lespedeza at the rate of 15 pounds each. By early June the area was a wonderful pasture composed largely of the seeded plants but with the Bermuda getting well started. Cows were turned on the pasture at this time. The Bermuda spread under grazing very rapidly and by August had produced a perfect sod.

During the 1934 and subsequent seasons, Bermuda and white Dutch clover have constituted the only growth from this area, all the other clovers and grasses disappearing entirely from the sod after the first season. Each season the white clover comes to a practically perfect stand, producing very early grazing, and lasts through May. Although hop clover is abundant in the pasture of which this area is a part, it has as yet not become established in this new section. This is a rather unusual situation since this clover has come without seeding on all surrounding pastures after liming and superphosphate treatment.

This pasture demonstrates that white Dutch clover is well worth consideration for use in Bermuda pastures and that these other grasses cannot be depended upon for the first year.

Pasture Studies

The three-year study on the grazing value of Bermuda and carpet grass pastures under various fertilizer treatments, and the four-year study on the effect of various fertilizer treatments on the yield and composition of Bermuda pasture under plot conditions have been prepared for publication and should be available in bulletin form within the near future.

Corn and Soybean Silage

A short preliminary feeding trial for 500 1000-pound-cow days with silage made from corn and soybeans grown in the same row indicated this crop to be very satisfactory as the only roughage for milking cows. The mixture was composed of 60 per cent corn to 40 per cent soybeans by weight. There is a slight objectionable odor to silage having this high a percentage of soybeans, but it does not affect the palatability or feed value. Until further work is done to check this point, it is suggested that the ratio of corn to soybeans be 75 per cent corn to 25 per cent soybeans.

Bang's Disease

A project in cooperation with the animal pathological laboratory is now under way which has as its aim a study of the power of the blood of individual cows to kill the organism Brucella abortus, the germ causing Bang's disease, or infectious abortion, in cattle. By means of this study it will be determined whether certain strains or families of dairy animals are resistant to this type of infection. We have had in our herd one family of Jersey cattle of which not a single individual has ever become positive to the blood test for Bang's disease, while every individual of another family of the same breed under the same conditions has become positive to this test. These observations, taken with about 75 blood tests on blood of individuals now in our herd, seem to indicate that there is such immunity.

Other Projects

A long time project designed to show the relation between the external form, the internal anatomy, and the producing ability of dairy cows is being carried on in cooperation with the Bureau of Dairy Industry of the United States Department of Agriculture. The South Carolina Station is one of about 20 state experiment stations cooperating on this project. and at present ranks third in the volume of data contributed. Data have been obtained on 11 cows during this year, making a total of 70 cows reported since the project was started at this station.

Other long time projects include studies of systems of breeding dairy cattle, analysis of production records and methods of expressing the inheritance of dairy animals, and the economical growth and development of dairy calves and heifers.

CHEMISTRY

The Chemistry Department is cooperating with all the other departments of the Experiment Station where chemistry is an important factor. At the present time this department is interested in 10 research projects of the Experiment Station. In connection with these projects, 1036 samples of various kinds were received and analyzed during the past year. These samples have required a variety of analytical work, both mineral and organic.

One new project was begun about the middle of the year. This project is a study of the factors influencing the carotene content of cat-

tle feeds. Pasture grasses and silage are some of the important feeds being studied at present. Since carotene is an important constituent of many feeds and foods, a knowledge of its quantitative distribution will be of much value.

ENTOMOLOGY

Up to June 30, insect pest activity for 1936 had been below average, evidently because of the severe winter and severe spring drougth. Emergence in cages was low and early season increase was lessened. It has been an interesting and instructive opportunity to observe climatic effects.

Boll Weevil Emergence

The past winter was very destructive to boll weevils in hibernation. Only 0.00133 per cent emerged from the hibernation cages at Clemson College and this emergence occurred very early in the season.

Oriental Fruit Moth

Oriental fruit moth infestation of peaches, both twigs and fruit, was probably less this season than at any time since the insect became established in South Carolina. Infestation was so light and scattered that the collection of infested twigs for parasite studies was prevented. Examination of peaches at picking time showed less than one per cent infestation in several commercial orchards examined in Spartanburg and Greenville counties.

Test plots at Clemson developed from 0.1 to 1.5 per cent fruit infestation. So little infestation gives an unfair test of materials, but sprayed plots nevertheless showed only one-fourth as much Oriental fruit moth infestation as in the check plots. Over 25,000 peaches were examined from the 1936 plots.

Southern Corn Stalk Borer

Because of very wet spring weather followed by drought, the 1936 corn plots were not planted on schedule at Florence, Summerville, or Clemson. A planting at Summerville on May 4 showed four per cent first generation infestation; May 20 had no infestation. At Florence, March 17, April 20, and April 28 plantings were infested 22, 24, and 12 per cent respectively. At Clemson, April 17, and April 27, May 5, and June 8 plantings were infested 14, 14, 10, and 0 per cent.

Rice Weevil

Field data for the season will not be available until after corn is harvested. In control studies an attempt is being made to obtain data relative to limiting factors of the dusting sulfur treatment of seed corn. Excellent control has been obtained in relatively tight containers but not in open, well ventilated containers.

Thrips on Cotton

Cotton in the Pee Dee section that came up during late April and early May suffered considerable local damage by thrips. This which came up after June 10, after the drougth was broken, showed no signs

of injury. Seventy-five per cent or more of the injury this season was done by Sericothrips variabilis (Beach), a species previously unknown in injurious numbers on cotton in this state. The species previously encountered were practically absent on seedling cotton.

To ascertain actual reduction of yield caused by thrips, 100 stalks each of normal and severely injured cotton plants were selected for study. Daily blooming records were kept on each plant. These records showed that the injured plants were delayed in blooming by about 10 days to two weeks, which would render them subject to much more loss from the boll weevil. At the end of the season production records will be taken from these same plants.

Control experiments were conducted on 1/20-acre plots replicated three times. In these studies nine different control materials were used, seven dusts and two sweetened arsenical poisons. The formula that gave the highest kill and the most protection to the cotton plant was a combination of 90 per cent sulfur and 10 per cent paris green applied as a dust at the rate of about 15 pounds per acre.

Cotton Flea Hopper

Cotton this season is generally of two distinct ages: i.e., that which came up before May 1 prior to the drought, and that which came up subsequent to June 10 after the drought was broken. On the older cotton at Florence, flea hoppers have not developed to a point of significance. However, the younger cotton may yet suffer considerable injury, as young fields with nearby sources of infestation were on August 10 quite heavily infested.

Experimental plots have received two applications of dust with encouraging results coming from a 90 per cent sulfur-10 per cent paris green mixture applied at the rate of about 12 pounds per acre. Pure dusting sulfur, and a mixture of 75 per cent calcium arsenate and 25 per cent paris green, are also being used and are giving a considerable reduction in the flea hopper population.

Weekly sweepings in 10 fields at Florence and at Clemson show that the flea hopper has been generally more abundant at Clemson all season. On old cotton at Florence the peak of abundance occurred about August 15.

Miscellaneous Cotton Insects

The cowpea aphid, **Aphis medicaginis**, which was first observed on cotton on May 4, developed into a serious problem by June 1 in several counties of the Pee Dee section. The dry cool weather was unfavorable for rapid reproduction of parasites and predators, yet was quite favorable for development of the plant lice.

On the Experiment Station farm the plant lice infestation was materially reduced by the application of a nicotine sulfate, molasses sweetened poison mixture at a concentration of 1-800, which was applied for the boll weevil as well as aphis.

Three species of cotton leaf hoppers, **Alchoneura unipuncta, Graphocephala versuta,** and **Empoasca fabae,** were caged on cotton. The feeding of each resulted in tiny discolored spots, appearing as though the chlorophyil had been destroyed. The first two species readily reproduced and developed on cotton but the latter failed to reproduce on cotton in the tests thus far conducted.

Geocoris punctipes Say, commonly known as the big-eyed bug, was observed preying on the cotton flea hopper, **Psallus seriatus,** and was repeatedly seen preying on adults of the flower thrips, **Frankliniella tritici.**

The common cotton aphid, **Aphis gossypii,** was observed in considerable numbers for the first time this season about July 25, but no decided injury had resulted by August 10.

Mexican Bean Beetle

The average emergence for the Mexican bean beetle for the year 1935-36 was 21.95 per cent. The first beetle emerged on March 24 and the last one emerged on June 15. Heavy infestations are ordinarily to be expected with an emergence as high as this, but at no time during the season has the infestation in the experimental plots been high enough to produce injury sufficient to justify experimental work. We attribute this to the exceptionally dry season which prevailed during the period of greatest emergence.

No survey for spread of this insect will be made this year.

Tomato Fruit Worm

Injury by this pest is chiefly in the early part of the season, and its effect on the whole crop is not as bad as often thought. The adult insects appear to have a decided preference for laying eggs on corn silk rather than on tomato plants. Spraying or dusting with poison at intervals of 10 days to two weeks results in about half as many wormy fruits as when no treatment is given. Only in years of severe injury does such treatment give a noticeable money profit.

Wintering Bees

Tests of various kinds of winter protection for bee colonies were continued through the past winter.

No significant superiority of protected colonies either in colony strength or honey crop produced has been noted for the protected colonies over unprotected ones. Due to the unusual continuous cold of the past winter, which lessened bee activity, it is believed that any possible beneficial effect of winter protection was obscured.

Faunal Survey

This consists chiefly in recording the species of insects known to exist in the state. During the year, the number of recorded state species increased from 4,922 species to 5,287 species, a gain of 365

species, or a general average of one addition per day throughout the year. In several groups the records now give a good idea of what the state fauna contains.

FRUITS AND VEGETABLES

Apple Pollination and Sterility Studies

Results of previous work have shown that the Ben Davis is the best pollinator for the usual varieties of apples grown on a commercial scale in South Carolina, although Black Ben, Early Harvest, and Delicious can be used under certain conditions. The Ben Davis pollen not only results in a better set, but also seems to cause a larger percentage of the fruits to hang on the tree until they reach maturity than does pollen from some other varieties. The Ben Davis matures along with Winesap and Stayman, is an excellent keeper, and brings greater monetary returns to the grower than does a pollinator variety such as Early Harvest. The latter ripens in late June or early July, is as perishable as a peach, and has a rather limited market demand.

Pollen from those varieties which are good pollinators remains viable considerably longer than that from varieties classed as poor pollinators. Yates has been found to be a good pollinator for most of our commercial varieties, but seems to be incompatible with Stayman Winesap.

Studies on this problem during the past year have been carried on mainly along two general lines. All these involve a study of pollen, including observations of viability, longevity, and variability in size of pollen grains or different varieties. The effectiveness of pollen of certain varieties which previous tests indicated were at least partially intersterile was also studied. The second line of work deals with the preparation and staining of root tips from seed of known crosses for chromosome counts. This phase of the problem is now being emphasized.

In general, pollen from the first and last blossoms to open was less viable than that taken when most of the blossoms of the tree were opening. Pollen of the Yates and Golden Delicious loses its viability sooner than the pollen of the Delicious, Jonathan, Ben Davis, or Gano varieties. This was more pronounced during very warm, humid conditions.

Pollen of members of the Winesap group (Stayman, Black Twig, and Winesap) loses viability more rapidly than the pollen of other more potent varieties. The anthers of the Winesap contained a very small number of apparently normal though generally ineffective pollen grains.

The relation between the variability in the size of pollen grains of a variety and its effectiveness is being studied.

Yates was ineffective as a pollinator for the Stayman, and it was less effective as a pollinator for the Black Twig and Winesap than the Delicious, Jonathan, Ben Davis, or Gano. The Early Harvest was ineffective as a pollinator for the Black Twig, and was less effective than the Delicious, Jonathan, Ben Davis, and Gano on the Winesap and Stayman. The degree and cause of this apparent incompatibility is being investigated further.

Factors Influencing the Fruiting Habits of the Fordhook Bush Lima Bean

This variety of Lima bean is very popular on most Northern markets but in certain parts of the country, as in this state, the yield in most years is very low. Results have shown that weather conditions, viz., high temperatures and low humidity, are mostly responsible for the low yields. When such conditions occur, the pollen does not germinate, hence the ovules cannot be fertilized. When the humidity is high along with high temperatures, a satisfactory crop is usually set.

The past year, determinations were made of the chlorophyll content of the leaf, osmotic pressure of the sap, the carbohydrate and nitrogen content of the leaves and stems, and the stomatal behavior of the Fordhook and Wood's Prolific varieties. Observations and data indicated that the Wood's Prolific, which is a small-seeded variety, possessed a significantly greater chlorophyll content of the leaves, a higher osmotic pressure of leaf sap, a higher carbohydrate content of the leaves and stems than the Fordhook, which is a large-seeded variety. The stomata of the Wood's Prolific variety were open to a greater extent and for a longer time during the day than those of the Fordhook.

The higher chlorophyll content of the leaves, the greater stomatal opening, and the higher carbohydrate content of the Wood's Prolific variety indicate the variety has a greater photosynthetic rate and a greater capacity to maintain a carbohydrate-nitrogen balance inducive to fruitfulness than the Fordhook.

These physiological differences of the two varieties explain, at least partially, the greater yields of the Wood's Prolific as compared with the Fordhook, when grown under hot dry summer conditions at Clemson College.

Fruit Varietal Studies

The selection of a variety of any fruit by a commercial grower is of fundamental importance, for success or failure often hinges on that selection. The Horticultural Department has been growing several hundred varieties of various kinds of fruits and nuts, mainly peaches, grapes, and apples. A more limited number of varieties of plums, cherries, and raspberries is being tested. Only a few varieties of any fruit have the necessary characters to adapt them for commercial production, but many of them are well adapted for home orchards and local markets. It is in such orchards that one usually finds the best quality fruit. Many of our commercial varieties are of poor to medium quality, whereas varieties not adapted to long distance shipping are often of superior quality.

In addition to the four yellow-fleshed freestone varieties of peaches, Eclipse, South Haven, Valiant, and Golden Jubilee, recommended for trial last year, two other varieties are recommended for trial this year. These are the Hale Haven and Fay. Both are yellow freestone varieties of good quality and are more highly colored when hard ripe (shipping stage) than the first four varieties named. While the Hale Haven and Fay have fruited only a few years, they show possibilities of becoming important

varieties in this state. The Hale Haven ripens along with South Haven and Valiant about 10 days before Elberta, and the Fay ripens a week to 10 days after Elberta.

Vegetable Varietal Studies

New and improved varieties of various vegetables are grown each year for comparison with the present standard varieties. The breeding of new varieties by a number of experiment stations has been increasing for some years, and such new varieties are tested as soon as it is possible to get seeds or plants. At the present time, varieties of sweet corn, snap beans, tomatoes, beets, lettuce, etc., are being tried at Clemson.

THE CLEMSON COLLEGE FARMS

The functions of the Farms Department are: to maintain and improve the soil; conduct experiments with field crops; grow crops on a larger scale as demonstrations; produce the crops for the Agronomy Department used for experimental purposes; and grow feeds for the experimental herds of dairy cattle, beef cattle, hogs, sheep, and poultry.

This year the plan of operation includes a comparison of the yield of corn when fodder is pulled, when corn is shredded, and when the ear is matured in the field without removing the fodder from the stalk; a test of six popular varieties of cotton for yield and staple when grown on large plots; a continuation of soil improvement with manure versus rye and vetch in the production of cotton; and reterracing of 100 acres of land using the Nichols type terrace with terrace outlets and terrace outlet channels.

The acreages being grown to crops this year by the Farms Department are as follows:

Corn	137
Corn and soybeans	78
Cotton	84
Oats	51
Oats and vetch	59
Wheat	2
Barley	10
Rye	24
Rye and vetch	4
Austrian winter peas	45
Soybeans	88
Cowpeas	20
Bermuda and Johnson grass	10
Cane	4
Total crop acres	616

The corn crop is very good and should yield more than 40 bushels per acre. All the corn except one acre in variety observation plots is grown as a general crop to be used for livestock in the college herds.

From the 78 acres in corn and soybeans, 600 tons of silage will be cut as feed for dairy and beef cattle. The remainder of the corn will be harvested as grain, the soybeans being left on the ground to improve the soil.

Of the cotton crop of 84 acres, the Farms Department is conducting an experiment on three acres with fresh manure versus a cover crop of rye and vetch for the improvement of soil where cotton is grown continuously. On 30 acres there are six promising varieties of cotton planted —one variety to the terrace, using four replications. The remainder of the area is in small plots devoted to variety tests and fertilizer experiments conducted by the Agronomy Department.

Due to the cold weather and frequent overflow of Seneca river, practically the entire crop of oats and oats and vetch was a failure.

A rotation of barley and corn is grown in one field of 18 acres to secure data on the comparative cost and yield of the two grains. On this area there is also a soil-building program in that soybeans are grown a a companion crop with corn, and lespedeza is grown with and after barley. Both the soybeans and lespedeza are turned back into the soil.

As a part of the soil maintenance and improvement program, the 24 acres of rye, the four acres of rye and vetch, and the 45 acres of Austrian winter peas, which produced excellent crops, were turned into the soil.

Fifteen of the 88 acres of soybeans are grown for seed, six acres for silage, and 61 acres for hay. The 20 acres of cowpeas are also to be used for hay.

POULTRY

The work of the Poultry Department has been centered to a large degree upon the control of fowl paralysis. Rigid practices of management and sanitation have been followed as a means of control. Studies on the possibility of immunizing chicks against the disease, as well as determining causes and control factors, are under way. The matter of inherited resistance in different families of chickens is being investigated.

Further investigations on interior egg quality are being conducted. Certain feeding and management factors are being measured as to their effect upon the amount of thick white, yolk structure, and color.

Studies on the utilization of calcium, phosphorus, nitrogen, and sulfur by the laying hen indicate the close relationship between calcium balance and egg production. The ability of a hen to transfer calcium to egg shell appears to be a limiting factor in egg production. Determination of some of the factors affecting the utilization of calcium would be the first step in solving some of the practical problems in breeding and feeding for high egg production.

Growing rations for chickens are being compared. The effect of the addition of oats, wheat bran, and milk are under study. Further study on the best amounts of and combinations with cottonseed meal to include in the chick starting and growing rations are being continued.

Feeding and management problems with laying hens where groups of birds are used have been suspended until some means of combating fowl paralysis may be found. The high mortality often experienced makes comparisons between feeding or management practices impossible. A number of problems as rations for laying hens, amount and method of artificial lighting for highest egg production, and types of houses and housing methods for layers will be taken up as soon as the livability of the flock can be improved and support for the work is available.

HOME ECONOMICS

The gathering of data for three studies has consumed a large proportion of the time of the staff of the Home Economics Department during the year. The field work incident to one of the investigations has been done, and that for the other two will be completed in September. In addition to the studies cited, effort has been made to promote the wider use of the findings of research bearing on home and community life.

The Use and Purchase of Household Textiles by Farm Families. The data gathered in eight representative South Carolina counties should furnish the basis for estimating textile production needs within the state which will be adequate but not in excess of consumptive demands of textiles for household use by white and negro farm families. The information gathered is in the nature of an inventory which reveals the types, quantities, and cost of the textile fabrics used by farm families at different income levels. Two per cent of the farms operated by white and negro owners and non-owners in each of the eight counties were visited and an effort was made to have the sample represent the prosperous, medium, and restricted farm households in each group. Information was secured concerning the purchases for one year prior to the day on which the data were secured. It indicates the customs of farm families in the matter of usage, purchase, and replacement of such fabrics by the households. The analysis and interpretation of the data are now under way.

Study of the Production and Consumption of Dairy Products by Farm Families

Information as to the ownership of cows, the amount of milk produced, and the consumption of milk and milk products by farm families is being secured from two per cent of the white and negro operated farms in seven counties of South Carolina. According to prevailing belief, South Carolina farm households are not adequately supplied with milk and milk products, but this opinion is not based on an authentic study of the situation. Since milk is regarded as the most nearly perfect of all foods for meeting the nutritional needs of people of all ages, carefully gathered facts concerning the amount produced and the use

made of it by farm families will furnish information of value. Such facts will be supplied by the investigation under way. If the data gathered reveal underproduction and consumption of milk and milk products by South Carolina farm households, it is hoped that the conditions reported will aid in inducing more adequate provision for milk production and of milk and milk products consumption.

Food Consumption of Farm Families in the Lower Coastal Plain of South Carolina. This project calls for detailed weekly records from approximately 20 white and 20 negro farm families each month of the year, so taken that Florence, Dorchester, and Charleston counties each contribute records for the four seasons of the year. This means that 120 families in the three counties will furnish four records each, or a total of 480 individual family records.

The analysis of records will show the quantities and money value of foods consumed, the nutritive contents of the diets, and the food production practices of the families studied. It is believed the results will give information on which to base farm family food budgets for this section of the state. Comparisons with the results of a similar study made a few years ago in the Piedmont section will be of value. In addition, it now seems likely that data on farm family diets from several of the central counties of the state will be secured from a study now being made by the Bureau of Home Economics of the U. S. Department of Agriculture. Thus for the first time detailed quantitative data on farm family food habits in different sections of the state will be available for interpretation.

THE COAST EXPERIMENT STATION

The investigations conducted at the Coast Experiment Station during the present calendar year have been concerned with projects in beef cattle production; the use of green forage crops in the production of market hogs; the development, fertilization, and management of permanent pastures; the adaptation and use of forage crops and recent pasture grass introductions; a continuation of studies in timber production; and some agronomic studies with corn, sorghum, and sugar cane.

Beef Cattle Investigations

The beef cattle projects at this Station are being conducted in cooperation with the Bureau of Animal Industry, U. S. Department of Agriculture. In lieu of a study of the effect of mineral feeding on the growth and breeding qualities of beef cattle, initiated in 1930 and concluded in the fall of 1935, three new projects in beef cattle managment were begun this year. These projects are as follows:

(1) A comparison of the beef-producing capacities of native broom sedge pasture, untreated carpet grass-lespedeza pasture, and carpet grass-lespedeza pasture treated with lime alone, lime and superphosphate, and

basic slag alone. Forty high grade Angus steers are being used in this project, each individual pasture being stocked according to its carrying capacity throughout the grazing season. In addition to the beef-producing capacities of these pastures as measured in steer weights, clippings from caged areas are made at two-week intervals, grass weights recorded, and samples retained for feed and mineral analysis.

(2) To determine whether temporary pastures can be satisfactorily substituted for silage in wintering yearling steers. In this work, 20 yearling high grade Angus steers are fed ensilage throughout the wintering period, while another lot of 20 steers is grazed on rye pasture instead of the ensilage ration. Concentrates and dry roughage are identical for both lots.

(3) To determine the value of creep feeding beef calves in developing breeding stock. The procedure of this project is to divide 20 purebred Angus calves into two comparable lots, one lot being fed a ration of three parts of cracked corn, two parts of ground oats, and one part of cottonseed cake; while the other lot receives only milk from their dams and pasture. The ration and pasture for the dams of each lot of calves is identical. This project will take into consideration the rate and economy of gains, as well as the sale value of the calves at the end of the feeding period.

Hog Feeding Experiments

During the present year, two hog feeding tests were conducted. The winter feeding project consisted of a comparison of protein supplements, viz., flame dried fishmeal, steam dried fishmeal, sardine meal, and digester tankage. Fifty purebred Poland China pigs from the station herd were used in this project. No conclusions can be drawn from this work which has been under way only one season.

The summer feeding work now under way consists of a comparison of the forage crops, sorghum, Pearl millet, Biloxi soybeans, and peas in the green stage only, and peas in the green and through the mature stage. All lots are being fed corn and fishmeal free choice in addition to the forages, and are checked by an additional lot which is being fed corn and fishmeal free choice in dry lot. At the close of this season's work, the summer forage crop test will have been completed and the data made available. Results to date show that the amount of fishmeal consumed is much less when the hogs have access to forage than when confined to dry lot.

Pasture Studies

Included under the heading of pasture studies are the following projects:

(1) A study of the effect of superphosphate and basic slag, with and without potash, on the growth and on the feed and mineral analysis of carpet grass-lespedeza pasture. The fertilizer applications are made on

28 1/20-acre plots at three-year intervals. Clippings are made at two week-intervals, yields recorded, and samples retained for feed and mineral analysis.

(2) The establishing and maintaining of common lespedeza in old carpet grass sod. In this work, four two-acre plots were scarified with spring tooth harrow and then seeded with 10 pounds of common lespedeza. In addition and prior to seeding, the four plots were treated as follows:

Plot 1—2000 pounds of dolomitic lime per acre
Plot 2— 500 pounds of 16 per cent superphosphate per acre
Plot 3—Check, no treatment
Plot 4—1000 pounds of basic slag per acre

Stand counts of lespedeza made in late spring of this year showed the basic slag plot to have a lespedeza stand approximately 50 times denser than that on the untreated plot; while the lime and superphosphate plots showed a lespedeza sod approximately seven times denser than that of the check plot.

Forage Crops and Pasture Grass Adaptation

In addition to the use of forage crops in the hog feeding experiments, the forage crop investigations include plantings of lespedeza sericea for hay, annual lespedeza versus peas for hay, 21 soybean varieties compared as to green forage and seed production, and a number of pasture grasses grown in nursery for adaptation studies. During this spring, 10 new pasture grasses were transplanted to the grass nursery for observation. These plants were furnished by the Division of Forage Crops, Bureau of Plant Industry, U. S. Department of Agriculture.

Corn, Sorghum, and Sugar Cane

The corn investigations at this station consist of a variety test which includes 16 white and eight yellow varieties. The sugar cane work consists of a comparison of six of the leading varieties as to disease resistance, adaptability, and syrup-making qualities. The seed stock for this work was furnished by the Office of Sugar Cane Investigations, Bureau of Plant Industry, U. S. Department of Agriculture.

Forestry Studies

No new projects in timber production have been initiated in the past several years. Work along this line has consisted in the care and protection of earlier plantings and others studies in the natural reproduction of pine forests.

Repairs and Permanent Improvements

Due to lack of funds for this purpose, no major repairs or improvements have been made as yet this year, with the exception of the construction of approximately two miles of barbed wire fence. This fencing was necessary in connection with the new cooperative project in beef cattle management. It is planned to repaint some of the station's buildings as soon as funds for this purpose are available.

THE PEE DEE EXPERIMENT STATION

The Pee Dee Experiment Station at Florence is in the heart of the Pee Dee section of the state, and is well situated to serve the agriculture of that area. Cotton, tobacco, corn, small grain, peanuts, and sweet potatoes are the principal crops grown, and our experiments and investigations are confined largely to these crops.

Agronomy Projects

The agronomic work at this station consists chiefly of variety trials and fertilizer experiments with crops generally grown in this section, and the work has been so planned that results obtained will be of practical value to our farmers.

Each year variety tests are conducted with corn, cotton, wheat, oats, tobacco, peanuts, and potatoes, and from the results obtained we are enabled to advise growers as to the best varieties of each of these crops. Variety trials this year include the following: 41 varieties of cotton, 13 varieties of corn, 22 varieties of oats, 18 varieties of wheat, seven varieties of rye, and 22 varieties of tobacco. These tests are visited each summer by hundreds of farmers, who, in this way, obtain firsthand information as to growth and behavior of the different varieties when grown under the same conditions.

Cotton

Obtaining and maintaining perfect stands of cotton is one of the most important factors in securing maximum yields. Better stands and higher yields have been obtained in numerous tests from acid-delinted and machine-delinted seed than from normal seed. Seed dusted with organic mercury dust disinfectants have given better stands, higher yields, and less disease than have undusted seed. The cost of such treatments is very low compared with the benefits derived, and as a result of these tests more farmers every year are practicing seed treatment before planting.

Plantings of cotton at weekly intervals over a period of years, beginning March 15 and ending May 10, show that plantings made the first two weeks in April have given the highest yields. Cotton planted in rows 3, 3 1/2, and 4 feet wide has yielded as follows over a period of seven years: 1857, 1822, and 1761 pounds per acre respectively.

Other experiments with cotton which have been under way for several years include time of applying fertilizer, rate of applying stable manure, sources of phosphorus, varying amounts of lime, and effect of time of picking on yield and quality.

Results obtained from machine fertilizer placement studies show that the position in which the fertilizer is placed in relation to the seed is a very important factor in obtaining good stands of cotton. Poor stands have resulted when the fertilizer was placed at various depths direct

beneath the seed. Better stands and correspondingly higher yields have been obtained by applying the fertilizer slightly to the side of the seed stream and one to two inches below it.

Soil Building with Winter Legumes

Winter legume cover crops of Austrian winter peas, hairy vetch Monantha vetch, and Hungarian vetch have been grown on the same areas since 1928. These are turned under about the middle of March and followed by cotton, using 500 pounds per acre of a 4-8-4 fertilizer. The cotton on half of each cover crop area has been side-dressed with 200 pounds of nitrate of soda. The beneficial effects of the cover crops is very evident, as practically no increase in yield of seed cotton is now obtained from the 200 pound side-dressing application. Cotton without nitrate of soda following cover crops is making more than cotton with 200 pounds of nitrate of soda on check areas where no cover crop was grown. The above experiments are duplicated, with corn following the various winter cover crops, but due to insects passing the winter on some of the cover crops and attacking the young corn plants, it has been impossible to maintain good stands of corn.

Nitrogenous Fertilizer Studies

Within recent years a number of nitrogenous fertilizers have been placed on the market, and we are testing the efficiency in crop production of the most important carries. Twelve of these are used as sources of ammonia for side-dressing cotton, and nine as the sole source of ammonia. Results obtained so far indicate that some are more efficient in crop production than others.

Farmers generally have been very much interested in knowing the relative efficiency of the different brands of nitrate of soda in crop production. In order to determine if there was any material difference, a test using the old process Chilean soda, Chilean Champion soda, and Arcadian soda has been conducted for several years, using each as the sole source of ammonia for cotton. Yields over a five-year period for each are as follows: Old process Chilean soda, 1708.0 pounds; Arcadian soda, 1703.4 pounds; Chilean Champion soda, 1698.6 pounds of seed cotton per acre. These results indicate that there is no difference in the various brands for cotton production.

In order to determine the most profitable amount of nitrogen to apply as side-dressing to cotton, the following amounts per acre have been used on cotton for a number of years: 50, 100, 150, 200, 250, and 300 pounds per acre. Under the conditions of these tests, where 650 pounds of a 4-8-4 fertilizer was applied before planting, 100 to 150 pounds of nitrate of soda per acre have been the most profitable rate.

Corn

Average corn yields for South Carolina are comparatively low, but through the use of improved seed of high yielding varieties, there is opportunity for considerable increase in yield at practically no additional

cost. Farmers generally are becoming more interested in growing only the best varieties, and from our variety studies conducted every year we are enabled to advise them as to best varieties and source of seed. Highest average yields for the past six years have been made by Douthit, Latham's Double, and Pee Dee No. 5, with 51.0, 50.6, and 49.6 bushels per acre, respectively.

Biloxi soybeans have been planted in the drill with corn when corn was planted for the past five years in order to determine to what extent, if any, the corn yield is reduced by the beans. The average yield of corn for the five-year period is as follows: Corn with beans, 41.9 bushels; corn without beans, 44.4 bushels per acre. Most of this difference occurred in 1935 under conditions of extreme drouth, resulting in low corn yields.

New plant introductions that might prove profitable to the agriculture of this section are being tested at this station every year, with the view of determining their possibility as profitable crops to be grown in this section. Strain and variety trials are being made with the following: Lespedeza, castor beans, artichokes, crotalaria, sesbania, pyrethrum, soybeans, pepper, and flax. As a result of these tests, new strains and varieties of various crops have been found well adapted to our conditions.

Cooperative Cotton Projects

A large part of the work at this station is conducted on a cooperative basis with the Bureau of Plant Industry and the Bureau of Entomology of the U. S. Department of Agriculture. Our cooperative work has recently been enlarged by the transfer of Mr. W. H. Jenkins of the Bureau of Plant Industry to this station for research work with cotton. His work largely consists of conducting one of the regional cotton variety tests, cotton breeding, and studies in cotton genetics. Extensive hybridization work have been under way this year with Sea Island and Tidewater, with the view of developing a variety with extremely long staple that will be adaptable to areas where Sea Island was formerly grown.

Plant physiology studies with cotton are being made in which cotton plants are grown in nutrient solutions of high and low magnesium content to note the effects of varying amounts of magnesium upon plant growth, fruiting, and fruit shedding.

Tobacco

Tobacco investigations constitute an important part of our research work at this station. Being one of our major crops, we are doing everything possible to solve the problems of tobacco growers. Mr. W. M. Lunn of the Bureau of Plant Industry is in charge of this phase of work, which consists of fertilizer placement studies, disease and insect control, rotations, seed bed preparation, variety tests, consisting of 22 varieties, and fertilizer and nutritional studies, in which 80 different fertilizer combinations are being used. Numerous farmers visit the station every year to observe and study the effects and results of these various treatments.

Entomology

This station is cooperating with the Bureau of Entomology and Plant Quarantine in several phases of work. Mr. F. F. Bondy, with several assistants, is in charge of boll weevil control investigations, consisting of hibernation studies and field control methods. Twenty-nine thousand weevils were used in hibernation studies the past winter. Various poison combinations are being tried out on a number of farms in the county as follows:

Molasses, 1-1-1 mixture alone
1-1-1 molasses mixture followed by calcium arsenate dust
Calcium arsenate dust alone
Paris green 1 part, lime 2 parts
Calcium arsenate 1 part, lime 1 part
Calcium arsenate 1 part, lime 2 parts

The cotton root louse was very destructive to young cotton seedlings this year, and in many fields stands were practically destroyed. At present, no control methods are known, but life history studies are being made of this insect, from which we hope to obtain information that will lead to methods of control. Parasites that destroy the weevil larvae in the square are being reared in the insectary after which they are released in cotton fields. Leafhoppers, boll worms, and leaf worms are other cotton insects with which studies are being made and control methods developed.

The corn billbug frequently does serious injury to young corn in this section of the state, often destroying stands on low areas. At present, we are working out the life history and control measures for this insect. We are also testing different treatments and methods of storing corn to lessen the damage of the corn weevil to stored grain.

Peanuts and Sweet Potatoes

Peanut and sweet potato investigations at this station are carried on in cooperation with the Bureau of Plant Industry. Several varieties of peanuts are included in tests with different kinds of fertilizer and various spacings. The Improved Spanish developed at this station is one of the best yielding varieties.

The sweet potato work consists of a variety test of 16 varieties, spacing tests, time of setting, and various fertilizer combinations. The Porto Rico and Nancy Hall have proven superior in variety tests. A fertilizer containing eight to 10 per cent potash has given best results.

THE SANDHILL EXPERIMENT STATION

The accomplishments of this station during the past year have been satisfactory, and new light is being thrown on the solution of problems dealing with the successful farming of Sandhill lands. This station by reason of the fact that it is located on soil very low in natural fertility and productiveness is also serving as an excellent situation for the study of problems of fertility and crop production which would require a much longer period were these studies located on more fertile soil. At the same

time, however, the results obtained here show quickly what is taking place on more productive land, and the value of the findings therefore being of a fundamental nature have a much wider application than within the boundaries of this region.

The subjects which have heretofore been the object of study continue to claim the attention of the staff. These subjects cover problems in fertilization, management and plant studies of the principal agricultural and horticultural crops of the region, as well as plants not ordinarily produced here but which may be adapted. The dairy unit is intended to study the usefulness of such a unit as an adjunct in the utilization of this type of land and in the maintenance of the fertility of the same.

Cotton Research

Data secured from the average yields of four years from an experiment using soluble magnesium salts and dolomitic limestone in a source of potash test shows that a deficiency of available magnesium may be a limiting factor in the yield of cotton on this soil.

The average yields of cotton during a three-year period in which a comparison was made of the response from calcium in calcium sulfate and dolomitic limestone in a source of phosphorus test shows the application of lime to the plots receiving the mono-ammonium phosphate and di-ammonium phosphate had a marked effect upon the yield of cotton. The average yields on the unlimed plots were 276 and 201 pounds of seed cotton, respectively, whereas the yields from the limed plots were 598 and 601 pounds of seed cotton, respectively. There has been a decreased yield each year on the unlimed plots, whereas the yields on the limed plots are among the highest in the entire test. The addition of calcium sulfate to the mono-ammonium phosphate plots in amounts approximately equal to that contained in superphosphate produced a marked increase in yield of seed cotton.

The data for the average yield of four years from an experiment on rate and time of applying potash fertilizers to cotton show that there is very ltle difference in the yields from the various times of applying potash fertilizers, either all before planting, one-half before planting and one-half at chopping, or all at chopping. The yields of seed cotton increased with the rate of potash fertilizer added. The data suggests that for the conditions of this experiment one pound of potash might be expected to produce 14 to 20 pounds of seed cotton.

Forage Crops

Forage crop studies which consist of trial plantings of numerous varieties and selections of crotalaria, soybeans, cowpeas, pasture grasses, winter legumes, and green manuring have claimed attention here. Several new projects have recently been initiated, including the study of crotalaria in rotation with cotton, date of planting crotalaria in small grain, chemical plant poison for shrub and weed eradication, and the effect of various fertilizer treatments on plant growth of Kudzu and napier grass.

Soybeans are planted extensively for hay and seed, and are interplanted with corn for silage. Thirty varieties including the vegetable types and 140 selections were in trial plantings last season.

Cowpeas are well adapted to sandy soils and are used extensively for hay and soil-improvement crops. Thirteen commonly known varieties were in trial plantings.

Sixty-five species of crotalaria were planted in the nursery last year for observation of plant growth, adaptability for forage purposes, and seed yields, and to provide material for the selection of early maturing strains. Crotalaria, having the ability to make a splendid growth on poor soil without any fertilizer, as well as being resistant to drought, attractive when in flower, and prolific in seed production, is a plant well worth the attention which has been given to it.

Several green manuring trials are under way to study the value of non-legumes and legumes and their effect on the crops which follow.

Soil Fertility

This line of investigation contemplates the study of the influence of fertilizer and green manures upon yields and upon the organic matter content of the soil.

An experiment with green manure and fertilizers which compares the crop yields and effect on the soil of a three-year rotation of legumes, corn and cotton, under different systems of fertilization, has been in progress since 1929. The average crop yields for the period indicate that the use of a 6-8-4 fertilizer following the removal of the legume for hay produced larger crops than the use of a 2-8-4 fertilizer supplementary to green manuring. Corn and cotton yields were also significantly higher on the plots where rye and vetch are grown as a winter cover than on plots which lie fallow during the winter.

The lysimeter investigations are being carried on as usual and are continuing to render interesting data, as is also the fertilizer ratio experiment with soybeans.

The fertilizer placement study which was begun here seven years ago is being continued in an altered form, it having been quite clearly indicated by the results obtained that for the most satisfactory results the fertilizer and the seed must not be placed in the same vertical plane.

Horticulture

The experimental fertilizer plots with peaches bore their fifth crop in 1936. The no-potash series have developed significant symptoms of deficiency, evident in fruit yield, foliage characters, and fruit bud development. The omission of phosphorus has likewise resulted in inferior tree performance, although the effect seems to result from the failure of cover crop growth in the no-phosphorus plots, rather than in direct deficiency symptoms. The use of nitrogen alone has resulted in a combination of these troubles and affords a striking demonstration that complete fertilizers are essential for proper nutrition of the peach tree in the sandy soils of this area.

An effort is made to include in the variety test as many as practical of the newer varieties of peaches to provide information to the grower as quickly as possible on the fruit qualities and tree performance of the several varieties being tested. The great importance of judicious selection of varieties for the commercial grower makes this phase of work of considerable interest and value.

The experimental work with grapes is concerned chiefly with the testing of varieties on their own roots and grafted on resistant stocks. Many of the better varieties are very weak growers in this section, or, if vigorous for a few years, are quite short-lived. It is believed that such varieties can be effectively maintained by the use of certain root stocks. The vigorous first-year growth of varieties field budded on one-year stock vines indicates that a grafted vineyard could be established in the same period as one of its own roots.

A block of asparagus uniformly fertilized for the first three years of its productive life with a 5-7-5 (N-P-K) formula was given a series of differential treatments beginning in 1933. Two years' results from these treatments suggest that the high rate of fertilization, i.e. 2000 pounds per acre, is necessary for most efficient production; that the increase of phosphorus and/or potassium above the amounts in the application, 2000 pounds of 5-7-5, has not increased either yield or grade; that the omission of potassium has resulted in decreased grade and yield; and that the omission of phosphorus has not decreased grade or yield.

Analyses of asparagus crowns dug from a series of plots varying in fertilizer and harvesting treatments to study the seasonal chemical composition of the crowns indicate that the asparagus plant stores reserve food chiefly as sucrose and reducing sugars, with the starch content relatively low, also that the percentage of composition is affected very slightly by differences in fertilizer treatment They indicate further that the harvesting practices determine the extent of depletion of food reserves, and that depletion of food reserves takes place most rapidly just following the harvest period, suggesting that the actual harvest is not an extreme drain on food reserves. This is further substantiated by studies on the effect of prolonging the harvest season.

Plant yields on some 600 individual crowns illustrate the great variability in the Mary Washington variety, and demonstrate the need of breeding work in this field. Twelve high yielding crowns of the most desirable type have been isolated as foundation stock.

Dairying

Breeding work with the dairy herd is designed to develop, through the use of proved-for-production sires, a herd pure in its inheritance for high milk and butterfat production. Twenty-seven foundation females have made 23 officials records that average 9889.3 pounds of milk, 490.6 pounds of fat, at an average age of two years, five months, and 26 days.

Gallant Cavalier, the first proved bull used in the herd, has sired 18 daughters, seven of which have now completed official records averaging

7782.2 pounds of milk, 426.2 pounds of butterfat, at two years, five months, and three days of age. Uplands General, the second proved bull, mated to daughters of Gallant Cavalier has sired 12 females. None have completed official records but three are now on test. Saugerties Royal Sequel, a third proved bull, has just been purchased to mate with the daughters of Uplands General and Gallant Cavalier. The bulls resulting from this breeding program are selected and loaned to dairy farmers who cooperate in proving them for production. Six such bulls are now on loan with cooperators in South Carolina.

The experiments in the use of annual crops for grazing are designed to measure the total digestible nutrients produced by annual crops, and develop a year around grazing system. This project has been in operation for three years. Converting total digestible nutrients to alfalfa hay equivalent, the three-year average is 3076 pounds of hay per acre. The average length of the grazing period is 254.7 days.

The project to determine the carrying capacity of permanent pasture has been in operation five years. The average carrying capacity is 124 1000-pound-cow days per acre, and the average length of the grazing season in 152 days. Total digestible nutrients secured measured in terms of alfalfa hay equivalent average 2117 pounds per acre.

THE TRUCK EXPERIMENT STATION

The South Carolina Truck Experiment Station is located seven miles west of Charleston in the heart of the coastal trucking area where a large acreage is devoted annually to cabbage, potatoes, tomatoes, beans, and other vegetable crops. The station carries on research work with most of the kinds of vegetables that are grown commercially in the state, and it cooperates with the U. S. Department of Agriculture in insect and plant disease studies. A brief summary of the major projects is given in this report.

Fertilizer Experiments

During the past year, fertilizer work with vegetable crops included tests of 16 different formulae, experiments with different rates of applications and percentages of organic nitrogen, placement tests, and a special test of sources of potash in relation to bean yields. Much of the new data obtained checks closely with results previously reported. As planned, the fertilizer experiments are to be carried on for at least five years, and it is expected that at the end of that time valuable information will have been secured relative to fertilizer practices for truck crops in South Carolina.

Results obtained up to this time indicate that less fertilizer per acre may be used with most truck crops without cutting yields, and in some instances, yields may actually be increased by reducing the quantity of fertilizer below that commonly applied. Increases in tomato and bean yield were observed where less than the usual amount of potash was

used in the fertilizer mixture. So far, 0-2 per cent of potash in 1000 pounds of fertilizer per acre has been more profitable than the use of five per cent of this element. Potatoes and cabbage responded to potash in quantities up to five per cent in one ton of fertilizer per acre.

Beans and potatoes, both short season crops, have failed to respond to organic fertilizers and have yielded just as much where all mineral fertilizers were used as where 50 per cent of the nitrogen was in the organic form; but tomatoes and cabbage both showed an increase in yield where as much as 33 per cent of organic nitrogen was present in the mixture.

Variety Tests

Variety and strain tests were conducted last year with 15 different kinds of vegetables. Many new hybrids and selections were included in the test. Varieties which appear to be more or less adapted to South Carolina conditions are checked closely for yields, quality, and other factors before they are recommended for planting. New varieties which have been tested recently and found worthy of further trial include A & C cucumber, Rutgers tomato, Surcropper sugar and Suwannee sugar corn, Chippewa and Katahdin potatoes, Asgrow Stringless Black Valentine bean, and the November, January, and February strains of cauliflower broccoli.

Vegetable Breeding

Breeding work with beans and cabbage has been in progress for a period of three years, and very encouraging results have been secured. By hybridization and selection early stringless beans are being developed which are particularly suited to South Carolina conditions.

The cabbage work centers on the improvement of the Charleston Wakefield variety by the development of strains which will head more uniformly than present strains, produce harder heads, and resist cold during the winter months. Cabbage is grown only during the cold part of the year in lower South Carolina, and severe losses are often experienced when temperatures drop suddenly following warm periods in the winter.

During the winter of 1935-36, which was unusually severe, many fields of cabbage were practically wiped out, but in going over the fields it was noted that there were occasional plants which had gone through the cold with no apparent injury. A number of these plants were selected and grown for seed, and progeny from these selections will be used in further breeding and improvement work with Charleston Wakefield and other cabbage varieties.

Other Projects

A number of minor projects were included during the past year, one of which consisted of a date-of-planting experiment with peas which resulted in highest yields from plots which were planted January 10. Second

Potato Seed Treatment

Rhizoctonia is one of the most important diseases attacking potatoes in South Carolina. Most of the seed received from the north is heavily infected with the sclerotia of this disease, and the climatic conditions during early growth are ideal for its development. As a consequence, considerable losses are experienced each year from poor stands and reduced percentages of No. 1 potatoes. To remedy this condition, work was started this year to determine the most economical and efficient material for the control of the disease. Five seed treatment materials were tested. Disease infection was reduced to a marked degree in practically all cases, and yields were increased as much as 14 per cent in the case of the best material tested.

Dusting for the Control of Late Blight

For many years potato growers throughout the trucking area have practiced a uniform system of dusting potatoes for the control of late blight. However, a study of the available reports shows that this disease has been present on the growing crop only six times during the last 19 years, and in only three of the reported years was the trouble of sufficient importance to reduce yields materially. From the weather data at hand, there seems to be a definite positive correlation between the amount of rainfall and the development of late blight, consequently service information appears to be more desirable than a general schedule of spray or dust applications. The station will be prepared to furnish such service during the potato growing season.

Control of Downy Mildew on Cucumbers

Downy mildew may be considered the most important factor limiting cucumber production throughout the trucking area. It usually appears about the time of first harvest and develops quite rapidly thereafter, destroying the vines and reducing the yields. In order to work out a satisfactory control for this trouble, work was started and plots laid out on which both dusts and sprays were used. The dusted plots yielded 10.5 per cent more than the untreated check, while the sprayed plots produced yields 5.0 per cent greater than those of the check plots.

Insect Investigations

The research work with truck crop insects is being conducted at the Truck Experiment Station by the U. S. Department of Agriculture.

Work during the past year consisted chiefly of a continuation of intensive studies on insecticide treatments against some of the insects affecting cabbage and cucurbits. The purpose of these projects is to develop efficient methods of preventing insect injury to the crops enumerated, without incurring the hazard of harmful insecticidal residues on the harvested products. The results of the work to date have been summarized in mimeographed Circular E-376 of the Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture.